MEDICAL LIBRARY

The Journal of Speech and Hearing Disorders

(Formerly THE JOURNAL OF SPEECH DISORDERS)

Published by the American Speech and Hearing Association

VOLUME 13 SEPTEMBER, 1948 NUMBER 3

TABLE OF CONTENTS

		Page
Serial Identification of Colors by Stutterers	CHARLES LIGHTFOOT	193
The Parent's Role in the Clinical Program	KENNETH SCOTT WOOD	209
Diagnosis and Prognosis in Cleft Palate Speech	CLAUDE E. KANTNER	211
The Speech Correction Foundation	WENDELL JOHNSON	223
Infant Speech: The Effect of Family Occupational Status and of Age on Use of Sound Types	ORVIS C. IRWIN	224
Neurophysiological Clues to Auditory Acuity	LEO G. DOERFLER	227
An Analysis of Wood's Articulation Index	ERNEST H. HENRIKSON	233
Evaluating the Efficiency of Group Screening Tests of Hearing	HAYES A. NEWBY	236
Techniques in the Management of Aphasics	VIVIAN M. SHEEHAN	241
Cooperation in a Public School Speech Correction Program	THOMAS D. HOUCHIN	247
Great Psychological Effects of a Minor Speech Defect	ALFREDO DUB	251
A Public School Program for Hard of Hearing Children	ELVENA MILLER	256
The American Hearing Society	HELEN SCRIVER	260
Organizing a Speech Clinic in a Small College	HEROLD LILLYWHITE	264
Students and Graduates in Speech Correction In the United States	MARTIN F. PALMER	267
Anticipatory Speech Responses in Children with Artculatory Defects	MARY ELLEN HULL	268
News and Announcements	MIRIAM D. PAULS, *Editor*	273
Book Reviews	ERNEST H. HENRIKSON, *Editor*	283
Abstracts of Current Articles	MARY HUBER, *Editor*	286

Issued Quarterly

Editorial Staff

Editor

Wendell Johnson . . . . . State University of Iowa

Editorial Assistant, Louise S. Barchat

Associate Editors

Spencer F. Brown . . . . . State University of Iowa
Lee Edward Travis . . . . . University of Southern California
Claude E. Kantner . . . . . Ohio University
Clarence T. Simon . . . . . Northwestern University
George S. Stevenson . . National Committee for Mental Hygiene, N. Y.

Assistant Editors

Ernest H. Henrikson: Book Reviews . . . . University of Minnesota
Mary Wehe Huber: Abstracts . . . . . Brooklyn College
Miriam D. Pauls: News and Announcements . Northwestern University
Martin F. Palmer: Records and Information . . Municipal University of Wichita

Business Manager

George A. Kopp . . . . . Wayne University

Officers: American Speech and Hearing Association

Martin F. Palmer . . . . . President
D. W. Morris . . . . . President-Elect
Spencer F. Brown . . . . . Vice-President
George A. Kopp . . . . . Secretary-Treasurer
Wendell Johnson . . . . . Councillor Ex-Officio
Herbert Koepp Baker . . . . . Councillor Ex-Officio
Elvena Miller . . . . . Councillor-at-Large
Charles R. Strother . . . . . Councillor-at-Large
Eugene McDonald . . . . . Councillor-at-Large
Grant Fairbanks . . . . . Councillor-at-Large
Robert West . . . . . Councillor-at-Large

The Journal of Speech and Hearing Disorders is published quarterly in March, June, September and December of each year by the American Speech and Hearing Association. Publication Office: 19-27 North Jackson Street, Danville, Illinois. General Business Office: Speech Clinic, Wayne University, Detroit, Michigan. Editorial Office: Speech Clinic, State University of Iowa, Iowa City, Iowa. Subscription: $3.50 per year; Canada and foreign, $4.00. Single copy, $1.00. Entered as second-class matter at the Post Office in Danville, Illinois, under Act of Congress of March 3, 1879. Printed by The Interstate, Printers and Publishers, Inc., 19-27 North Jackson Street, Danville, Illinois.

The Journal of Speech and Hearing Disorders

(Formerly THE JOURNAL OF SPEECH DISORDERS)

VOLUME 13 SEPTEMBER, 1948 NUMBER 3

Serial Identification of Colors by Stutterers

Charles Lightfoot*

SINCE READING aloud is a series of varied responses to successive stimuli consisting of combinations of printed symbols, it may be regarded as a serial discriminative activity. It is possible that reading aloud may have some relationship to other serial discriminative activities, even those not involving verbal responses. It might even be possible, after observing a performance of the latter type, to say whether or not the performer would be likely to stutter if he were to read aloud, and possibly even to say something about the probable severity of the predicted stuttering. Such considerations as these led the author to the execution of an experiment, which it is the purpose of this article to report.

Of particular interest to the investigation were a number of studies concerned with blocks revealed by subjects engaging in serial discrimination. Probably the first of these studies was one made by A. G. Bills (**2**) while exploring the subject of 'mental fatigue.' Bills noticed that subjects performing repetitive tasks, such as color-naming, tended to interrupt their flow of responses by more-or-less regularly recurring pauses which lasted twice as long as the average response or even longer. He called these interruptions 'mental blocks,' and he made the following observations concerning them:

1. Practice reduces the frequency of blocks.[1]
2. Errors tend to occur with them, 'suggesting that the cause of errors lies in the recurrent low conditions of neural functioning which the blocks reveal.'
3. Prolonging the performance tends to increase the frequency and duration of blocks.
4. There is, however, hardly any decrement in the average reaction time between blocks.

After further experimentations, Bills (**4**) came to the conclusion, among others, that blocks occur

*Charles Lightfoot (Ph.D., Northwestern) is Assistant Professor of Speech, Kenyon College, assigned to the faculty of the School of Aviation Medicine, N.A.T.B., Pensacola, Florida, as Associate Director of the Acoustic Laboratory.

The author is grateful to Professor Wendell Johnson of the University of Iowa for stimulating interest which led to the formulation of the problem discussed in this article and to his Advisory Committee consisting of Professors Harold Westlake, Raymond Carhart, Robert Seashore, Paul Moore, and Clarence Simon (Chairman), all of Northwestern University, for furnishing suggestions which aided incalculably in the author's completion of the doctoral thesis which this article summarizes.

[1]Throughout this paper, Bills' definition of 'block' will be used. The term, unless qualified, will not be used to refer to stuttering as such.

whether performance is manual or vocal and consequently must be dependent upon some neural factor. Other studies by Bills (**3**, **6**), Bills and Shapin (**7**), Warren and Clark (**24**), Kleitman (**14**), and Berdie (**1**) contributed more information concerning blocks by exploring the relationship of their occurrence to respiratory rate, anoxemia, benzedrine sulphate dosage, diurnal variation, type of stimulus, and other variables. Since most of the findings of these studies, all of which involved performance of normally speaking subjects, have but indirect bearing on the problem under discussion, they will not be summarized here; however, some of the results will be mentioned in later sections of this paper as they become pertinent.

A survey of the literature revealed three studies which dealt with stutterers' serial discriminative action other than reading. G. A. Kelly (**13**) administered what he called a 'visual aphasia test' and an 'auditory aphasia test' to 12 stutterers and to a similar group of normal speakers. These tests were similar to those of Bills in that they called for responses to regularly recurring stimuli; however, the 'aphasia tests' required responses more complicated than color-naming. The stimuli of Kelly's visual test were pairs of two-digit numbers placed on a moving kymograph tape which was covered by a shield containing a window large enough to expose one number at a time. The subject responded by writing the second of each pair, one digit of which was like one of the first pair. The auditory test involved successive presentation of three-digit numbers at three-second intervals on an Ediphone record. The subject was supposed to respond to each number by writing it with the first two digits in reverse order. Kelly found that his stutterers made a considerably higher percentage of errors on both 'aphasia tests.' After considering the performance of the stutterers, he said, 'It would appear, then, that "neural blocking" due to lack of cerebral dominance results in a transient sensory aphasia which may or may not be apparent in both visual and auditory fields, although there is a general tendency for both fields to be involved.' (**13**, 189-90).

Bills (**5**), after comparing the serial color-naming behavior of 28 stutterers with that of 33 more fluent speakers, made the following observations: (1) Stutterers block about twice as often as normal subjects in both vocal and manual responses. (2) The blocks of stutterers are significantly longer than those of normals in both types of performance. (3) The blocking of stutterers does not increase proportionately with fatigue as does that of normal speakers, at least for short working periods. (4) Stutterers with slow reaction time block more frequently and longer than stutterers with quick reaction time. (5) Stutterers do not differ from others in speed of reactions between blocks.

Cross (**10**), although not concerned with blocking, was interested in comparing, in addition to various other motor abilities, the manual serial numeral-identification speed of stutterers with that of normal speakers. To this end, she conducted a study, the results of which showed that her stuttering subjects made more unimanual discriminative responses per minute with either right or left hand than did her control groups consisting of both right and left handed normal subjects.

The Problem

It was the opinion of the writer that Bills' study of stutterers (**5**), which appears to lend support to the probability of a relationship between manual blocking and oral hesitancy, is not corroborated by the results of Kelly (**13**) or Cross (**10**). As we have seen, Kelly used a different definition of 'blocking' and required a different type of response from his subjects than did Bills. The evidence furnished by Cross seems to disagree with the findings of Bills, for even though the former did not check for

the presence of blocks, she presented data to show that her stutterers had a faster manual serial discriminative reaction time than did her control subjects even though she made no allowance for blocks, assuming they were present. This disagreement suggested the need for re-examining the question: do stutterers differ from normal speakers in rate of manual identifications of varying stimuli presented serially?

It is possible, of course, that the results presented by Bills are not in complete disagreement with those offered by Cross. It is conceivable that, although the average stutterer might reveal a gross response rate comparable to that of other subjects, the variation among his responses might be so high that his record would show more blocks than average. This interpretation, however, is not in accord with Bills' statement to the effect that the between-block reaction time of stutterers is about the same as that of non-stutterers. It seemed desirable, therefore, to seek an answer to the question: do stutterers differ from others with respect to optimum reaction time (i.e., reaction-time exclusive of blocks)?

To know how stutterers compare with other subjects with respect to reaction time—whether calculated with or without blocks—tells us little about the nature of the individual responses. Duration of any single response is ordinarily considered to be the time which elapses from the initiation of that response to the beginning of the following one. In the case of a response requiring the giving of a signal, such as depressing a key, this total time—and, consequently, the average reaction time—is dependent upon two components: (1) the time between the making and the breaking of the signal, and (2) the time between the breaking of that signal and the making of another. It is possible for two individuals with identical reaction times to differ with respect to both of these components. Aid to the uncovering of possibly differentiating characteristics in manual serial discriminative performance of stutterers might come with an answer to the question: if allowance is made for differences in average reaction time, do stutterers differ from normal speakers in average response-release time?

If we had reason to believe that stutterers differed from non-stutterers in reaction time, we would find little cause for surprise in a statement, like one made by Bills (**5**), to the effect that the total duration of manual blocks made by stutterers is greater than ordinary. However, a statement, like another made by Bills (**5**), to the effect that total duration of blocks by stutterers is greater than that of normals, even when the unit of measurement of each individual is his optimum reaction time, is of considerable interest to the speech pathologist. Indeed, in the eyes of the author, it was of such interest that it called for re-examination of the question: in terms of corrected mean response duration, do stutterers devote more time to blocking than do more fluent speakers?

In order to have a better understanding of the possible relationship between manual serial action and stuttering, it was decided to seek answers to two questions closely related to, yet distinct from, the one presented immediately above: in terms of corrected reaction time, does the average manual block of stutterers last longer than that of non-stutterers? How do stutterers and non-stutterers compare as to the proportion of responses devoted to these blocks?

In view of the apparent agreement between Bills (**2**) and Warren and Clark (**24**) as to the association of blocks and errors, one might suppose that stutterers—assuming that they block more frequently than non-stutterers—make an unusually large number of errors and thus possibly account for Kelly's results (**13**). Consequently, the question was raised:

do stutterers make a larger number of incorrect responses during manual serial discrimination than do other subjects?

Warren and Clark's comments (**24**) to the effect that the great majority of blocks were accompanied by errors and that most of these errors occurred immediately before their respective blocks suggested another aspect of serial discriminative activity for study. Thus two more questions came to be asked: how do stutterers and non-stutterers compare with respect to proportion of blocks accompanied by errors? Do the two groups differ with respect to the relative locations of blocks and errors?

While considering the hypothesis that serial discrimination requiring manual responses shares certain factors operating in serial discrimination calling for vocal responses, the author reasoned that analagous variables of the two sorts of performance should vary somewhat alike, both in direction and degree. It seemed reasonable to suppose that a fluent reader should be more adept at manual discrimination than a less fluent reader, and that the latter should be more adept manually than an even less fluent reader. This line of reasoning led to the formulation of the following additional questions for the investigation: do stutterers with a slow over-all oral reading rate (severe stutterers) differ from stutterers who read more rapidly (mild stutterers) with respect to gross manual response rate? Do stutterers who read slowly in between stutterings (severe stutterers) also perform slowly between manual blocks, and do they take a relatively long time to release each manual response as compared to stutterers whose similarly corrected reading rate is faster (mild stutterers)? Do stutterers whose stuttering takes up a considerable portion of their reading time (severe stutterers) differ from those whose total amount of stuttering is less time-consuming (mild stutterers) with respect to total amount of time spent in manual blocking when reaction times are equated? Do stutterers whose average occurrences of stuttering require as much time as several fluently uttered words (severe stutterers) have longer mean-block-durations than do those whose average occurrences of stuttering last but as long as one or two non-stuttered words (mild stutterers)? Compared to those who stutter on a small proportion of words while reading aloud (mild stutterers), do those who stutter more frequently (severe stutterers) (a) block on a larger proportion of manual responses, (b) make mistakes on a larger proportion of manual responses, or (c) distribute these errors around their blocks in a different way?

Bills' observation (**5**) that the averages based on frequency of blocks made by his stutterers remained about the same from minute to minute, while the comparable averages of his controls showed progressive increment, suggested that the time variable was worthy of investigation. The experiment was consequently given the assignment of answering the following question for each of the manual variables mentioned above: do period-to-period curves representing successive averages of the three populations being studied differ one from another with respect to shape?

By way of summarizing the purpose of the investigation, it might be said that an experiment was designed with a view to testing the following hypothesis: mild and severe stutterers and non-stutterers are alike with respect to mean performance for three slightly separated short periods, when the performance is some measurable factor of a serial discriminative activity requiring no speech, and when severity of stuttering is determined by a measurable aspect of oral reading analogous or otherwise related to the performance factor in question.

Subjects, Apparatus, and Procedure

The subjects selected for study were 45 young adults, including 30 stutterers and 15 non-stutterers of the same age range (15 to 35 years, with an average age of 24 years). In view of the possibility of a sex difference with respect to color-naming (**16**, **25**, **26**), each category was made to contain twice as many men as women. Since a number of studies reveal but slight, if any, correlation between serial discriminative action and other factors, no further matching was deemed necessary (**20**).

In order to divide the stutterers into 'mild' and 'severe' classifications, a three-minute phonograph record was made of each one's reading of one of S. F. Brown's prose passages (**9**). Each record was played back and analyzed with the aid of a constant-speed kymograph equipped with a magnetic pen. Following the method described by Johnson and Colley (**12**) and Curtis (**11**), the experimenter, as he listened to each record, closed the pen-control switch every time he detected an occurrence of stuttering and released contact when he judged the reading to be fluent again. The deflections of the ink line on the kymograph paper enabled determination of stuttering frequency and duration.[2] The total number of words read served as an index of gross reading rate. From these basic data, the following additional reading indices were obtained: (1) corrected reading rate—i.e., rate between stutterings; (2) corrected stuttering time—i.e., total time of interruptions divided by corrected reading rate; (3) corrected mean duration of stutterings—i.e., gross mean length of stutterings divided by corrected reading rate; and (4) corrected stuttering rate—i.e., percentage of words accompanied by stuttering. These corrected indices, along with gross reading rate, served as the five criteria by which severity of stuttering was evaluated. The 15 stutterers whose scores fell above the fiftieth percentile on the first criterion were classified as mild, while those who fell below that point were called severe. The scores on each of the other criteria were treated in the same way until finally there were ten classifications of stutterers—five 'mild' and five 'severe.'

The manual serial discriminative activity consisted of identifying colors presented one at a time by a serial discrimeter. Since the discrimeter has been described by R. H. Seashore (**21**), a brief summary of its basic characteristics should suffice here. Its most essential part is a disc in the back of which 100 pegs are set. These are arranged so that one peg lies against one of four claws which are aligned along a radius of the disc. When the claw is disengaged from the peg by the operator's depression of an attached key, a weight which is tied to a string wrapped around the axle of the disc causes the latter to rotate until another peg comes against another claw, which also has its attached key. One of 100 stimuli placed along the periphery of the disc may be seen by the operator—i. e., the subject—through a small window in a panel which blocks the remaining stimuli from his view. When he depresses the key which matches that stimulus, a new stimulus is brought into view. The subject may proceed with such serial action for as long a period as the length of the string attached to the weight will allow, which is sufficient to make the disc go through several complete rotations. When any one of the four response keys is depressed, it closes a make-break switch which deflects an electromagnetic pen from its position on a kymograph tape moving at constant speed.

Although the apparatus just described furnished an accurate means of measuring the number and length of responses, there was no way to distinguish correct responses from mistakes. To answer this need, the experimenter devised a means to have the previously described disc control a second make-break switch, which in turn controlled a second pen on the kymograph. Thus, a correct response deflected both pens; whereas, an incorrect one deflected only the pen controlled by the response keys. The original design of the discrimeter was altered further so that uniformly high visibility could be maintained. This was accomplished by mounting a small light in back of the stimulus window and using translucent stimuli.[3] There were 25 each of red, green, yellow, and blue stimuli with

[2] Rank-order correlations between these data and a second set of observations were 1.00 for both frequency and duration.

[3] For a more complete description of such alterations, see **15**, pp. 24-27.

each complete rotation of the disc. The order was randomized, with the exception that no two successive stimuli were of the same color.

In view of Kleitman's evidence (**14**) that there is systematic diurnal variation in color-naming ability, it would have been desirable to have all subjects perform at the same time of day. Although this could not be done with precision, it was possible to take all records between 11:00 a. m. and 7:00 p. m., with the majority between 12:00 n. and 4:00 p. m. In the case of the stutterers, the manual performance preceded the oral reading. In order to permit each subject to adjust to the laboratory situation and to encourage his full understanding and cooperation, a few minutes were devoted to explaining and demonstrating the apparatus and procedure. The subject was told to respond with a single finger in order to minimize the possible objection that typists or piano players might otherwise perform superiorly. The subject was allowed a maximum of two minutes for practice, during which the experimenter checked to see that directions were understood. When the subject was ready for the actual performance, the experimenter gave the signal to begin and simultaneously activated the kymograph and a stop-watch. At the end of three minutes, he stopped the kymograph and told the subject to stop. After a one-minute pause, the procedure was repeated. Then came another minute of rest, and then the third three-minute period, the end of which marked the close of the manual performance by that individual. The data for each of the 45 subjects were gathered in a similar manner.

Analysis of each subject's kymographic record enabled determination of three period-values for each of the following manual variables: (1) number of responses, (2) number of errors, (3) duration of key depressions, (4) number of blocks, (5) location of blocks relative to errors, and (6) duration of blocks. From these data, it was possible to derive the following indices, which were the primary concern of the investigation: (1) gross reaction time, (2) corrected reaction time—i. e., reaction time between blocks, (3) corrected response-releases time—i. e., mean duration of key depression in terms of corrected reaction time, (4) corrected block duration—i. e., total length of blocks in terms of corrected reaction time, (5) corrected mean block duration—number of corrected reaction times in excess of two consumed by average blocks, (6) proportion of responses accompanied by blocks, (7) proportion of incorrect responses, (8) proportion of blocks within three responses or an error (preceding, following, or both) and of those unaccompanied by error.

When scores of all subjects were obtained, the data for each of the first seven of the criteria variables enumerated immediately above were subjected to Fisherian analysis. The idea that the differences among the means of the populations represented by the three classifications (mild, severe, and non-stutterers) are negligible for all three periods was evaluated by testing two more specific hypotheses. The first of these was that the differences among the means are the same—not necessarily zero—for the three periods. To test this hypothesis, the scores of the fifteen individuals in one classification were arranged in three columns, each of which contained the individual scores of one period; and the interaction 'sum of squares' was computed. This sum was added to the similar group-by-individual sums obtained for the other two classifications, and the total was divided by the corresponding degrees of freedom to secure the error term ($Vs(gxi)$). A comparable estimate of the population variance was obtained from the classification-by-period interaction ($Vcxp$), which was determined after arranging the nine group totals into a three-by-three table, each row and column of which respectively included the group totals for one period and one classification. The hypothesis stated above was then tested by comparing the ratio of the two estimated variances with Snedecor's F-ratio for 4 and 84 degrees of freedom.

If, from the results of this F test, it seemed reasonable to suppose that the period-to-period performance curves of the three classifications were parallel, a test was made of the hypothesis that the differences among the population means represented by the three classifications was negligible. This hypothesis was evaluated by dividing the between-classifications variance by the classification-by-period interaction variance and then comparing the quotient with F for two and four degrees of freedom. If the second hypothesis seemed unreasonable, the differences between pairs of classification means were evaluated by *t* tests. If the first hypothesis appeared to be improbable, the between-group variance estimated for each period was compared with the within-group variance of the same period. In the event that significant differences were revealed, *t* tests were made of the differences between the means obtained for the period (cf. **18**).

Results

Gross Reaction Time

Figure 1 compares successive gross-reaction-time means of the three groups of subjects. The mild—i.e., the faster-reading—stutterers were the slowest manual performers during all three periods; the severe—i.e., the

slower-reading—stutterers were somewhat faster performers; and the controls were the fastest. The mild stutterers did not lower their reaction-time average with each successive period to the same extent as did the severe stutterers; while the latter did not progressively decrease their average to the same degree as did the non-stutterers. Analysis of these differences in reaction-time decrement

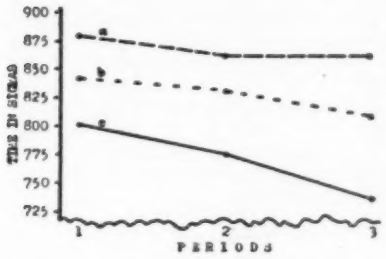

FIGURE 1. Gross-reaction-time means of mild (a), severe (b), and non-stutterers (c) for three 3-minute periods of manual serial color-indentification. (Stuttering severity determined by gross oral reading rate.)

did not allow them to be attributed to chance[4]; consequently the group means of each period were compared without regard to those of the other periods.

During the first period the mean reaction time was 880 sigmas for the mild stutterers (range: 733-1332); 840 for the severe stutterers (range: 706-1154); and 802 for the controls (range: 621-1034). Considering the wide variation within each group, the range of 78 sigmas covered by the three means appeared to be slight.[5] During the second period the mean was 863 for the mild stutterers (range: 682-1154); 829 for the severe stutterers (range: 698-1006); and 773 for the non-stutterers (range: 602-1018). Again variation among the means could be attributed to sampling error.[6] For the third period, the mild stutterers again averaged 863 sigmas (range: 675-1250); the severe stutterers dropped to 809 (range: 618-1052); and the controls averaged 735 (range: 601-951). Since, on the basis of an F evaluation, the variation among these means of the final period appeared to be more than chance alone would allow[7], *t* tests were made of the three differences involved. As would be expected, such a test of the 128-sigma difference between the mean of the mild stutterers and that of the non-stutterers gave good grounds for believing that the two groups represented different populations.[8] The second *t*, although not as large as the first, indicated that the mean of the severe stutterers may also have been different from that of the controls.[9] The third *t*, however, was not large enough to throw much doubt on the assumption that mild and severe stutterers do not differ with respect to gross reaction time.[10]

Corrected Reaction Time

Although the three classifications represented in Figure 2, which compares successive between-block reaction-time averages, are nominally the same as those represented in Figure 1, the basis on which the stutterers were divided for the second comparison was the rate of oral reading exclusive of time spent in stuttering. Again the mild stutterers were the slowest performers during all three periods; the severe stutterers were somewhat faster; the controls were fastest of all. Analysis of the classification-by-period interaction, which resulted in the progressive divergence of the curves shown in Figure 2, permitted the assumption

[4] $V_{c \times p}/V_{s(g \times i)}=2.950$ (Probability between .01 and .05.)

[5] $V_{g1}/V_{wg1}=1.74$. (P more than .05.)

[6] $V_{g2}/V_{wg2}=2.600$. (P greater than .05.)

[7] $V_{g3}/V_{wg3}=3.754$. (P between .01 and .05)

[8] $(M_{a3}-M_{c3})/SE_{diff}=2.528$.

[9] $(M_{b3}-M_{c3})/SE_{diff}=1.859$.

[10] $(M_{a3}-M_{b3})/SE_{diff}=1.097$.

of parallelism in the theoretical curves

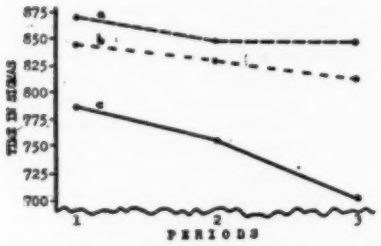

FIGURE 2. Corrected-reaction-time means of mild (a), severe (b), and non-stutterers (c) for three 3-minute periods of manual serial color-identification. (Stuttering severity determined by corrected oral reading rate.)

of which those shown are samples[11]; consequently, the three classification means were computed and compared. The mean corrected reaction time of the mild stutterers for all three periods was 852 sigmas (range: 667-1313); that of the severe stutterers was nearly 829 (range: 615-1153); that of the controls was 748 (range: 596-989). An F test indicated that the variation shown by these means was highly significant[12]; consequently, *t* tests were made in order to see whether the samples might represent two or three populations. Such an evaluation of the fact that the non-stutterers' three-period average reaction time exclusive of blocks was more than a tenth of a second less than that of the mild stutterers made the difference appear highly significant.[13] A second *t* comparison suggested that the difference between the averages of the severe stutterers and the controls was also significant, although not as highly so as the difference previously mentioned.[14] The third *t*, on the other hand, indicated that the relatively small difference between the two stuttering classifications might easily have been due to sampling error.[15]

Virtually the same results were obtained even when the stutterers were divided on the basis of gross reading rate, since the correction introduced by the deduction of time spent on stuttering required shifting only two stutterers from their first classifications. The slightness of the effects of changing the criterion for judging stuttering severity is not surprising in view of the high correlation between over-all reading rate and non-stuttering rate reported by Bloodstein (8).

Response-Release Time

The basis for classifying the subjects which furnished the data represented by the following chart remained the same as that described in the preceding section. The manual variable of present concern, however, is corrected response-release time; i.e., the average proportion of the corrected reaction time devoted to holding down the response key. We see that, during every period, the mild stutterers had the shortest average response-release time, the severe stutterers had the longest, while the controls kept the middle position.

An F evaluation of the classification-by-period interaction did little to discredit the hypothesis that the curves in Figure 3 are samples of three parallel population curves[16]; hence, we may ignore the nine group means and turn to the three general means of the classifications. The number of corrected reaction times required by 1000 mean response-release times averaged 205 for the 45 observations of the mild stutterers (range:

[11] $V_{c \times p}/V_{s(g \times i)}=0.571$. (P greater than .05.)

[12] $V_c/V_{c \times p}=29.818$. (P less than .01.) Although the assumption of homogeneity implied by the use of this ratio may be doubtful in this case, there is empirical evidence to show that homogeneity is not critical. (20, pp. 136-139.)

[13] (Ma-Mc)/SEdiff=2.736.

[14] (Mb-Mc)/SEdiff=1.945.

[15] (Ma-Mb)/SEdiff=0.618.

[16] $V_{c \times p}/V_{s(g \times i)}=1.192$. (P greater than .05.)

FIGURE 3. Number of corrected reaction times required by 1000 mean response-release times of mild (a), severe (b), and non-stutterers (c) for three 3-minute periods of manual serial color-identification. (Stuttering severity determined by corrected oral reading rate.)

101-518); 268 for the severe stutterers (range: 101-548); and 232 for the controls (range: 106-404). The significance of the variation among these means implied by an F test[17] suggested the advisability of comparing them two at a time by means of *t*. Such comparisons were made, with results which would probably allow most of us to agree that the difference between the controls and either the mild or severe stutterers might have arisen through sampling error.[18] The difference between the two stuttering classifications, however, cannot be dismissed so readily, even though the *t* evaluation of it might lead us to consider it as of but borderline significance.[19]

It should be pointed out that the *t* test just mentioned would allow somewhat less certain dismissal of the difference than would be expected in view of the previously mentioned F test, which would let the more inclusive null hypothesis be discarded with confidence at a level between one and five per cent. This discrepancy led to F evaluations of the assumption of equal homogeneity which accompanied the three *t* tests mentioned above.[20] Such an evaluation allowed retention of that assumption for the comparison of the mild stutterers and the controls. However, a similar evaluation would not allow acceptance of the test involving the less fluent stutterers and the controls unless we were also willing to assume that something had happened which chance would permit less than one time out of a hundred. Acceptance of the comparison of the two classes of stutterers would require almost as much credulity.

As a result of the F tests just discussed, it seems reasonable to conclude that the two stuttering classifications were probably from different populations as far as response-release ratio is concerned — a probability worth knowing even though we do not know whether the populations differ in means or in variances. If we are willing to accept a procedure which Snedecor (**23**, 83) offers as justifiable, we may use *t* to compare means irrespective of the heterogeneity of the populations they may represent. Following this procedure, which consists of entering the table as though the degrees of freedom were just half of what they would ordinarily be counted, would only slightly diminish the previously mentioned grounds for suspecting significance in the difference between the means furnished by the two classes of stutterers.

Corrected Total Block Duration

Each curve in Figure 4 represents three successive group averages of total block durations in terms of corrected reaction times. The total time spent in stuttering, after allowance had been made for variation in corrected reading rate, was relatively short for those stutterers referred to in this comparison as mild, and relatively long for those called severe.

[17] $V_c/V_{c \times p} = 17.686$. (P between .01 and .05.)

[18] (Ma-Mc)/SEdiff=0.855;
(Mb-Mc)/SEdiff=0.890.

[19] (Ma-Mb)/SEdiff=1.517.

[20] V(a)/V(c)=1.295;
V(b)/V(c)=2.285;
V(b)/V(a)=1.765.

The marked divergence of the curve

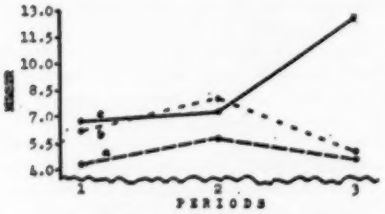

FIGURE 4. Mean number of corrected reaction times devoted to total block durations of mild (a), severe (b), and non-stutterers (c) for three 3-minute periods of manual serial color identification. (Stuttering severity determined by corrected stuttering duration.)

leading to the third period performance of the non-stutterers reflects the obtained probability that the samples did not represent three sets of parallel population performances.[21] Consequently, we must examine the results of each period separately as in the comparison concerning gross reaction time.

During the first period, the mild stutterers lost few chances to respond because of blocking (mean: 4.35, range: 0 to 17.0); the severe stutterers lost more (mean: 6.26, range: 0 to 20.2); the controls lost the most (mean: 6.73, range: 0 to 19.1). The differences among the group averages appeared negligible, however, when the amount of variation within each group was considered.[22] In the second period the order changed: the mild stutterers again devoted the least time to blocking (mean: 5.80, range: 0 to 18.4); the severe stutterers took the top position (mean: 7.94, range: 0 to 28.8); the controls dropped to a level between the two stuttering groups (mean: 7.24, range: 0 to 23.0). Again the variation among the means was too slight to suggest that more than a single population might have been represented.[23]

The range covered by the group means increased during the third period. The mild stutterers again spent the fewest corrected reaction times in blocking (mean: 4:61, range: 0 to 16.2); the severe stutterers spent a fraction more (mean: 5.16, range: 0 to 23.7); the controls spent a considerably greater number than either stuttering group (mean: 12.53, range: 0 to 29.8). Statistical analysis showed that the variation among these means was quite probably significant.[24] Further analysis indicated that only two populations may have been involved —one represented by the controls and the other represented by each of the stuttering groups.[25]

Mean Block Duration

As the investigation was conducted, the average block of one subject might exceed a duration equivalent to 200 per cent of his corrected response time, which was the minimum set by definition, by a greater amount than might that of another subject. Group

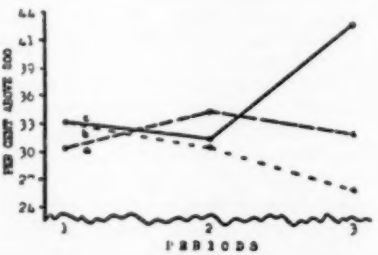

FIGURE 5. Average per cent (above 200) of corrected reaction times consumed by average blocks of mild (a), severe (b), and non-stutterers (c), for three 3-minute periods of manual serial color-identification. (Stuttering severity determined by mean duration of stutterings.)

[21] $V_{c^xp}/V_s\ (g^xi) = 2.770$. (P between .01 and .05.

[22] $V_{g1}/V_{wg1} = 0.581$. (P greater than .05)

[23] $V_{g2}/V_{wg2} = 0.423$. (P greater than .05)

[24] $V_{g3}/V_{wg3} = 3.279$. (P between .01 and .05.)

[25] $(M_{a3}-M_{c3})/SE_{diff} = 2.028$;
$(M_{b3}-M_{c3})/SE_{diff} = 1.821$;
$(M_{a3}-M_{b3})/SE_{diff} = 0.269$.

averages of such excesses are represented in Figure 5. It will be recalled that for this comparison, the stutterers were divided on the basis of number of words which might have been read during an average occurrence of stuttering.

The chart shows that the mild, severe, and non-stuttering groups did not differ much with respect to mean block duration during the first two periods as compared to the differences among them during the third period. More rigorous analysis of this apparent increment, however, did not indicate that it should be attributed to a multiplicity of sample sources.[26] Consequently, only the general classification averages are presented for comparison.

The mean block duration indices of the mild stutterers averaged 32.1 (range: 0 to 131); those of the severe stutterers, 29.8 (range: 0 to 87); those of the controls, 35.7 (range: 0 to 134). The between-classification estimate of the variance was larger than the estimate based upon the classification-period interaction by such a slight amount that it appears that all groups stemmed from the same population with respect to the variable under discussion.[27]

In contrast with Bills' conclusion (5), the results of this study would indicate that the chances are not in favor of finding a difference between stutterers and non-stutterers as far as length of average block is concerned. Indeed, it would seem that, if any difference does exist, it probably is in the direction of longer blocks for the latter.

Rate of Blocking

Figure 6 summarizes the averages of block-response ratios, which were used as indices of relative blocking rate. During examination of these data, it should be borne in mind that the average number of words read aloud between stutterings was used as the criterion of severity of stuttering.

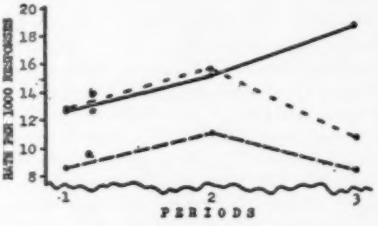

FIGURE 6. Average number of blocks per 1000 responses of mild (a), severe (b), and non-stutterers (c) for three 3-minute periods of manual serial color-indentification. (Stuttering severity determined by proportion of orally read words accompanied by stuttering.)

Although the curves obtained from the samples are not parallel, analysis of the variance allowed acceptance of the hypothesis that, between any pair of population means which two of the group means might have represented, there was no more difference for one period than for another.[28] Again, therefore, only the classification means based on all three periods will be mentioned. The average corrected blocking rate of the mild stutterers was 9.44 blocks per 1000 responses; that of the severe stutterers was 13.13; and that of the controls was 15.64. The difference between the highest and lowest averages was small in comparison with the ranges within the classifications, which for the mild, severe, and non-stutterers respectively, were 0 to 44, 0 to 61, and 0 to 49.[29] Once more an implication of this study is at odds with the findings of Bills (5), whose stutterers were reported to have blocked at a significantly higher rate than did his control subjects.

[26] $V_{c \times p}/V_{s(g \times i)}=0.702$. (P greater than .05.)

[27] $V_c/V_{c \times p}=1.041$. (P greater than .05).

[28] $V_{c \times p}/V_{s(g \times i)}=2.293$. (P greater than .05.)

[29] $V_c/V_{c \times p}=4.649$. (P greater than .05.)

Error Rate

Since there was disparity between results of this study and those reported by Bills (**5**), it was fortunate that an observation made by that investigator and confirmed by Warren and Clark (**24**) suggested a means of evaluating indirectly the relative blocking rate of stutterers and nonstutterers. Those authors found that a large majority of errors were associated with blocks. It seemed reasonable, therefore, to suppose that, if stutterers are likely to block relatively more frequently than are non-stutterers, then the former should make more errors. Similar reasoning made it seem advisable to retain the same basis for evaluating stuttering severity in the comparison of relative error rates as was used in the comparison of blocking rates.

Figure 7 shows the average error rates, in terms of number of errors per 1000 responses, of rarely stuttering, frequently stuttering, and nonstuttering groups. The variance estimated from the classification-by-period interaction was smaller than that estimated from the pooled group-by-individual interactions; hence, the hypothesis that period-to-period fluctuations are the same for the three classifications sampled seems reasonable enough to allow consideration of the general means.[30] Even when performance speed is taken into account, the mild stutterers made very few mistakes during their collective manual performance (mean: 18.07, range: 0 to 95). The severe stutterers were almost equally flawless (mean: 19.98, range: 0 to 73). The normal speakers, on the other hand, made a relatively large number of errors (mean: 52.44, range: 14 to 116). The variation among the means was far too great to permit the harboring of a null hypothesis concerning them.[31] Comparisons with t indicated that, unless one is willing to conclude that both mild and severe stutterers make fewer errors than do ordinary speakers, one would have to acknowledge the occurrence of events which could be expected but just a few times in several million trials.[32] The difference between the two classes of stutterers, on the other hand, could be attributed to chance with virtually no stretch of the imagination.[33]

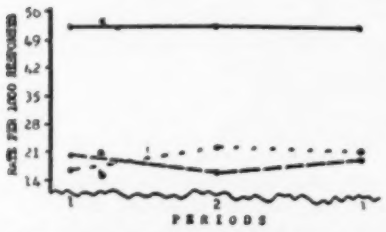

FIGURE 7. Average number of errors per 1000 responses of mild (a), severe (b), and non-stutterers (c) for three 3-minute periods of manual serial color-identification. (Stuttering severity determined by proportion of orally read words accompanied by stuttering.)

Location of Blocks Relative to Errors

Table 1 shows the proportion of blocks in each of four categories for the three periods of performance by the three classes of subjects discussed in the preceding section: (1) blocks occurring just after an error, i.e., within three responses; (2) blocks occurring just before an error; (3) blocks which could meet the specifications for both of the first two categories; and (4) blocks separated from errors by more than three responses. The observed proportions are accompanied by theoretical proportions, each of which is equivalent to the average of the three proportions obtained for one of the categories. At the bottom of the table are three figures caclculated to test, by means of Chi-square, the goodness of fit shown by each classification.

[30] $Vc^xp/Vs(g^xi)=0.434$. (P greater than .05.)
[31] $Vc/Vc^xp=202.005$. (P less than .001.)
[32] (Ma-Mc)/SEdiff=4.994;
(Mb-Mc)/SEdiff=4.889.
[33] (Ma-Mb)/SEdiff=0.306.

TABLE 1. Obtained and theoretical proportions of blocks in various categories showing location of blocks relative to errors for mild, severe, and non-stutteres. (Stuttering severity determined by corrected rate of stuttering during oral reading.)

Categories	*Obtained* (*Mild S's*)	(*Sev.S's*)	(*Non-S's*)	*Theoretical*
Within three responses				
after an error	.159	.119	.194	.157
before an error	.037	.059	.097	.064
both after and before	.011	.000	.038	.016
Beyond three responses from an error	.793	.822	.671	.762
Chi-square	1.196 (P greater than .70.)	3.633 (P greater than .30.)	10.067 (P between .01 and .02.)	

Table 1 reveals that the proportions of error-associated blocks made by the two stuttering groups were the exception that the mild stutterers smaller than the theoretical proportions in all three sub-categories, with produced a slightly larger share of blocks just after an error than the average. The comparable proportions for the controls were all larger than the hypothetical proportions. Conversely, the observed proportions of error-free blocks made by the stutterers were both larger than the average while the comparable proportion made by the non-stutterers was smaller.

A Chi-square evaluation did not render suspect the hypothesis that the block-error distribution of the mild stutterers was representative of the distribution characteristic of a larger population from which the three classifications might have been selected.[34] A similar evaluation made it seem reasonable to accept a like hypothesis with respect to the severe stutterers. The third Chi-square test, however, furnished considerable grounds for rejecting the idea that the coincidence of blocks and errors made by persons of normal fluency is like that of the mother population mentioned above. A fourth Chi-square test, based on the combined data of the other three, offered further evidence that the three classes of subjects represented are not alike as far as the variable in question is concerned.[35]

Of possible interest is the agreement of the data in Table 1 with Warren and Clark's observation that most of the error-associated blocks of their subjects occurred after an error rather than before. On the other hand, the hypothesis which this observation led them to make—i.e., that 'the error may have acted as a distraction which caused the block' (**24**, 104)—does not receive support from these data, which rather suggested that factors other than error-production must be more influential causes of blocks; at least the great majority of the blocks of both stuttering and non-stuttering groups were not associated with errors.

SUMMARY

Consideration of A. G. Bills' work on 'mental blocking' led to a study of factors possibly peculiar to stutterers' non-verbal identifications of

[34] The author acknowledges that there may be certain statistical shortcomings in the use of Chi-square to evaluate these data; however, it seemed to be the best available statistic under the circumstances. A defense of its use has been offered elsewhere (**15**, 67); space limitation prevents further discussion here.

[35] $x_1^2 + x_2^2 + x^2 = 14.896$. (P between .02 and .05.)

consecutively presented colors. For each of several such factors the following hypothesis was tested: Mild (MS), severe (SS), and non-stutterers (NS) are alike with respect to mean performance during any of three successive short periods, provided severity of stuttering is determined by an aspect of oral reading analogous or otherwise related to the performance factor in question.

Each of 30 young adult stutterers furnished a sample of oral reading, various features of which served as bases for classifying him as 'mild' or 'severe.' The stutterers and 15 normally speaking subjects each engaged in three three-minute periods (separated by one-minute pauses) of discriminative performance consisting of identifying colored squares presented by a serial discrimeter. There were four possible responses, each requiring the depression of a different key. Each response, in addition to exposing a new stimulus, deflected a pen set on a kymograph tape moving at a constant speed. If the response was correct, a deflection appeared in a second penline. Each subject was instructed to work as fast as he could without erring excessively.

Analysis of the kymographic records yielded values for several manual variables, each of which furnished a basis for comparing MS and SS with each other as well as with NS for each period's performance. Fisherian analysis suggested the following conclusions concerning the manual performances of the three categories of subjects:

1. When stuttering severity is defined in terms of over-all oral reading rate, the differences among the three groups with respect to gross manual reaction time during the first two periods might be attributable to chance; however, during the third period NS appear to represent a faster-reacting population.

2. When severity is determined by reading rate between stutterings, both MS and SS probably respond more slowly, on the average, for all three periods than do NS even when manual blocks—i.e., reaction times of an individual at least twice as long as his average for the period—are discounted.

3. When severity is again determined by reading rate during fluent intervals, SS tend to hold down the response key longer than do MS; moreover, SS are likely to vary more among themselves with respect to this variable than is true of more fluent speakers, whether labeled as stutterers or not.

4. Both MS and SS, when classified on the basis of total stuttering time divided by reading rate, devote significantly fewer optimum response times to manual blocking during the third period than do NS.

5. When severity is determined by mean duration of stutterings (in terms of reading rate), there is no reason to think that NS, SS and MS differ with respect to corrected mean duration of manual blocks.

6. When severity is decided by proportion of orally read words accompanied by stuttering, it would appear that the means of MS, SS, and NS respective block-response frequency ratios are about the same.

7. When proportion of stuttered words is again used as the criterion of severity, one might say with extremely high confidence that both MS and SS make fewer errors than do NS.

8. When the same criterion of severity is retained, there is reason to suspect that NS tend to have proportionately more blocks in the immediate vicinity of an error than do either MS or SS.

Discussion

Features of the results summarized above which were most interesting to the author were the low incidence of errors in the records of the stut-

terers, the difference between mild and severe stutterers in response-release time, and the disagreement with the results of Bills (**5**). In view of this latter consideration, it may be well to regard conclusions based on this study with more caution than would be called for had they been neither confirmed nor denied by other investigations.

Evaluation of factors which might account for the discrepancy between the results reported here and those previously reported by Bills (**5**) is difficult. The possible influences of time of performance cannot be adequately considered for the two studies since Bills' report, probably because it was written before Kleitman's study (**14**), does not mention an attempt to control possible diurnal effects. A similar statement may be made with respect to subject sex distribution as a source of error, for although Bills reported that all but two of his stutterers were males he did not give the sex ratio of his controls. A Woodworth-Wells color chart furnished the stimuli for Bills' subjects, whereas the serial discrimeter used in this investigation more nearly resembled the psyschergometer which Bills devised for his later studies of color-naming (**3**). It is difficult for the author to see, however, how this difference in stimulus presentation could account for such conflicting results as have been noted. A more plausible explanation might lie in the fact that Bills' subjects had to discriminate among five colors, while the author's had only four possible responses. The possibility that the additional color may have increased the level of the situation's complexity to a greater degree for the stutterers than for the non-stutterers seems worthy of consideration in view of the relationship between complexity and break-down in speech situations reported by Simon (**22**). Another factor to be considered, of course, is the ubiquitous one of motivation, about which the author finds it difficult to make meaningful remarks. Whatever the factors may have been, the fact remains that Bills concluded that stutterers block extraordinarily long and frequently and hence are neurologically different; whereas the data reported here suggest that stutterers, although they may work somewhat more slowly, make no longer and no more frequent blocks than speakers of ordinary fluency and that manual serial discrimination furnishes no basis for imputing physiological differences between the groups.

Response-release time appears to be an interesting index since, of the various serial-action measurements, it alone offered some basis for distinguishing severe stutterers from mild ones. Although the data were not clearly differentiating, they did suggest that stutterers who read with relative rapidity when not stuttering tend to hold the response key down less long than do stutterers whose optimum reading rate is slower. The possibility of there being a relationship between response-release time and muscular hypertension constitutes grounds for interesting speculation, in which the writer will not allow himself to indulge here.

The most interesting of the results under discussion, in the opinion of the author, was the paucity of errors in the performance of the stutterers. One might describe such careful performance as perfectionistic. It is conceivable that in perfectionism exists a measurable dimension of personality which might be missed by existing tests. Or possibly there is some connection between the perfectionism spoken of here and the fact that a large number of the stutterers tested by Richardson (**19**) offered responses undetermined by M or C when confronted by the Rorschach blots and scored low in R (rhathymia) when given the Guilford Inventory of Factors STDCR.

It seems to the author that the ap-

parent difference in serial reaction time between stutterers and non-stutterers is associated with the reluctance of the former to make incorrect responses. Such behavior may be compared to that of an amateur typist who tries to type an important document with several carbons. Every stroke of a key constitutes a minor crisis, a thing to be checked and double-checked before being acted upon. Possibly this lack of abandon, which resulted in such painstaking work on the part of the stutterers discussed here, was responsible for their failure to increase in response rate from period to period, as though some sort of control prevailed over each period's work. Whether or not this and other possible inferences are implied by the scarcity of errors in the stutterers' manual performances may be open to question; however, to suggest that error production of stutterers is worth further study should at least be a reasonably safe way to close the discussion.

References

1. Berdie, R. F. Effect of benzedrine sulphate on blocking in color naming. *J. exp. Psychol.*, 1940, **27**, 325-332.
2. Bills, A. G. Blocking: a new principle of mental fatigue. *Amer. J. Psychol.*, 1931, **43**, 230-245.
3. ———. Blocking in mental fatigue and anoxemia compared. *J. epx. Psychol.*, 1937, **20**, 437-452.
4. ———. Fatigue, oscillation and blocks. *J. exp. Psychol.*, 1935, **18**, 562-573.
5. ———. Relation of stuttering to mental fatigue. *J. exp. Psychol.*, 1934, **17**, 574-584.
6. ———. Some causal factors in mental blocking. *J. exp. Psychol.*, 1935, **18**, 172-185.
7. ——— and Shapin, M. J. Mental fatigue under automatically controlled rates of work. *J. gen. Psychol.*, 1936, **15**, 335-345.
8. Bloodstein, Oliver N. The relationship between oral reading rate and severity of stuttering. *J. Speech Disorders*, 1944, **9**, 161-173.
9. Brown, S. F. A quantitative investigation of certain phonetic, grammatical, and semantic factors influencing the incidence of stuttering. Ph.D. thesis, Univ. Iowa, 1937.
10. Cross, H. M. Motor capacities of stutterers. *Arch. Speech*, 1936, **1**, 112-132.
11. Curtis, James F. A study of the effect of muscular exercise upon stuttering. *Speech Monogr.*, 1942, **9**, 61-74.
12. Johnson, Wendell and Colley, W. H. The relationship between frequency and duration of moments of stuttering. *J. Speech Disorders*, 1945, **10**, 35-38.
13. Kelly, Geo. A. Common factors in reading and speech disabilities. *Psychol Monogr.*, 1932, **43** (*University of Iowa Studies in Psychology, No. 15*), 175-201.
14. Kleitman, Nathaniel. *Sleep and wakefulness as alternating phases in the cycle of existence.* Chicago: Univ. Chicago Press, 1941.
15. Lightfoot, C. M. *Manual serial discriminative action.* Ph.D. thesis, Northwestern Univ., 1946.
16. Lignon, E. M. A. Genetic study of color-naming and word reading. *Amer. J. Psychol.*, 1932, **44**, 103-121.
17. Lindquist, E. F. *Statistical analysis in educational research.* Boston: Houghton, 1940.
18. ———. Tests of hypotheses of special interest to research workers in the field of learning. Mimeographed pamphlet, March 12, 1945.
19. Richardson, L. H. A personality study of stutterers and non-stutterers. *J. Speech Disorders*, 1944, **9**, 152-160.
20. Seashore, R. H. Experimental and theoretical analysis of fine motor skills. *Amer. J. Psychol.*, 1940, **53**, 86-98.
21. ———. Techniques for measuring serial actions. *J. exp. Psychol.*, 1928, **11**, 45-55.
22. Simon, C. T. Complexity and breakdown in speech situations. *J. Speech Disorders*, 1945, **10**, 199-203.
23. Snedecor, Geo. W. *Statistical methods.* Ames, Iowa: Iowa State College Press, 1946.
24. Warren, L. F. and Clark, B. Blocking in mental and motor tasks during a 65-hour vigil. *J. exp. Psychol.*, 1937, **21**, 97-105.
25. Wissler, C. The correlation of mental and physical tests. *Psychol. Rev., Monogr. Suppl.*, 1901, **3**: No. 15.
26. Woodworth, R. S. and Wells, F. L. Association tests. *Psychol. Rev., Monogr. Suppl.*, 1911, **13**: No. 85.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 209-210

The Parent's Role in the Clinical Program

Kenneth Scott Wood*

IN MY clinical work I have found that progress with the child who has a functional speech defect is more successful when the parents are given clinical attention. Evidence based on a two-year study of fifty family cases shows that parental maladjustment is associated with functional speech defects in children and that a group of children whose parents were given clinical attention made significantly greater improvement in the speech correction program than the group whose parents were not so treated. This study was published in the December, 1946, issue of the *Journal of Speech and Hearing Disorders.*

The purpose of this paper is to offer some suggestions relative to the treatment of parents as part of the clinical program for the child. I believe that it is necessary to deal extensively with the parent whether the speech correctionist is working under a clinic plan or in a public school system.

1. The speech correctionist should bring about a revision of the parent's attitudes toward the cause of the child's speech defect. Many parents seem oblivious to the idea that they themselves had anything to do with the child's speech difficulty. They naively ask the clinician, 'Do you think his tonsils should come out?' They offer the statement, 'We thought maybe his tongue is tied.' And there is also that explanation which is so complimentary to the child and which parents would like to believe in regard to stuttering, 'We believe that he thinks much faster than he can talk.' Questions and statements like these reveal fundamental attitudes and pre-conceived notions on the part of parents; but, most of all, they indicate a predisposition to have the child's speech defect explained in terms of some single factor over which they as parents had no control. Some parents will even tell you that their child picked up his speech defect from the neighbor child. I have heard many questions from parents, but I have never heard them ask, 'Do you think that the kind of home-life I have given my child has had something to do with his speech difficulty?' A parent once told me that although her child was five years old, he could say only three things. When I asked what they were, I thought the answer was particularly revealing. The three things he had learned to say after five years of life were, 'no-no,' 'stop that,' and 'shut-up.'

The attitudes registered by many parents when they come to the clinic with their children indicate that they expect a quick, clean operation of some sort to clear up the defect at once; and I suspect that their coming is not so much motivated by a great desire to help the child as by a desire to eliminate the social embarrassment of having a backward offspring.

The first task of the clinician is to break down this parental frame-of-reference that speech correction is simple and that only factors beyond parental control are involved. Classes should be held for both mothers and fathers to explain how parents are involved in the cause of speech defects in their children and how they must necessarily be deeply involved in treatment. Parents who bring children to the clinic must be informed at the beginning that part of the clinical pro-

*Kenneth Scott Wood (Ph.D., U.S.C.) is Associate Professor of Speech Pathology and Clinical Practice, and Director of the Speech Correction and Hearing Clinic, University of Oregon at Eugene. The above article was presented to the American Speech and Hearing Association during the 1947 Convention.

gram is for them. In short, parents must learn that the clinic is not treatin a speech case, but a family case.

2. The clinical attention given the parents should take the form of securing their active cooperation in discovering and alleviating the family problems which are bound to interfere with the total adjustment of the child. In order to carry this purpose, parents should be invited to take a battery of personality tests which should be followed up with clear explanations of results and implications. Although there are many such tests, I recommend the Bernreuter Personality Inventory for a measure of neurotic tendency and the California Test of Personality for a picture of parental adjustment. Needless to say, the speech correctionist must be trained in the use of such tests. When combined with interview data, they are extremely valuable in helping the parent realize his or her personal problems. There are many speech clinicians who do not use such diagnostic instruments, and I make the point here that the one thing the clinician needs most in developing more effective techniques in the treatment of functional speech defects is training in clinical psychology.

3. Parents should be started out on a program of self-analysis through a reading program. A small reference shelf can be made available to them or books loaned for home reading. Two books I would place high on the list are *Personal Problems of Everyday Life* by Travis and Baruch (D. Appleton Century Co., 1941) and *The Parents' Manual* by Anna W. M. Wolf (Simon and Schuster, 1943). There are doubtless many other books which should be on every parent's reading list which would help parents change their mental ways of life and lead them to play the role of better mothers and fathers.

4. One of the most useful roles a parent can play in the clinical program is one of a reporter. Both mother and father, preferably the mother if only one, can be asked to write a running account of one day at home each week. The write-up should be a realistic one and not a superficial description. There should be liberal use of quotation marks and exact words. In these reports the feelings of the parent should be described; reactions of the child during the day should be recounted; disturbing as well as happy incidents should be related; and the parent should describe incidents where discipline was applied. The parent should be encouraged to write freely what is in her mind in an effort to reveal her brand of child psychology. Such reports can be of great use to the clinician in many ways: they tell the story of family relationships and provide reliable information with which to channel the program for both parent and child; the act of writing reports serves to affect future reactions of the parent in that it predisposes her toward self-examination and objectivity; and the assignment of such a task is an easy and logical way of bringing the parent into active cooperation with the clinic.

In summary, then, I suggest that when we treat the child's functional speech defect we look upon it as a speech defect syndrome—a collection of symptoms, many of which are generated by environmental factors which control the child. The salient environmental factor for the child is the kind of parents he has and the kind of home-life they order for him—wittingly or unwittingly. Treatment for the child should be accompanied by treatment for the parents. The parent program should teach mothers and fathers that they are involved in the deepest kind of way; that the solution of their own problems will meliorate those of their children; and that they can materially aid the work of the speech correctionist by learning how to play the role of a better parent in constructing a happier home where the child will want to listen to what is said and will have a chance to respond vocally to parents he loves.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 211-222

Diagnosis and Prognosis in Cleft Palate Speech

Claude E. Kantner*

IT IS the purpose of this article to discuss some of the problems involved in examining and diagnosing a case with cleft palate speech and in reaching a decision as to what should be done. Such a discussion must also of necessity consider the prospects for progress both generally and individually. However, since what we call 'nasality' is an almost inseparable part of cleft palate speech, it seems advisable to begin with the question, 'What is nasality?'

Obviously such statements as: 'Nasality is talking through the nose,' or 'Nasality is talking with the soft palate open,' or 'Nasality is speaking with a nasal quality on sounds that are not supposed to be nasal,' do not constitute adequate answers. It seems safe to assume that our understanding of the exact nature and etiology of the vocal quality, or qualities, that we rather vaguely designate as 'nasality' is far from complete. The following observations are not intended as dogmatic statements; rather they are offered in the hope that they will stimulate, if not clarify, our thinking on this subject.

Nasality is believed to be a matter of resonance, as we recognize when we speak of it as a voice quality. Hence the presence or absence of nasality can be considered as the result of changes in the over-tone structure of the voice. It might conceivably be caused either by the addition of certain overtones or partials to the so-called normal, non-nasal voice, or by the absence of certain partials, or by a change in the relationship of the partials.

Nasality at present is still a subjective phenomenon. There has been considerable research, but the writer is not aware of any findings that make it possible to look at a graphic representation of the sound waves in human voices and pick out any particular pattern of overtones that will *consistently identify nasality*. The final decision as to whether or not an individual is 'nasal' is still, I believe, to be reached only through someone's *subjective* judgment. It should be pointed out in passing that our individual judgments vary greatly as to what constitutes undesirable 'nasality' or a pleasant 'nasal resonance' in voices. This difference of opinion should cause us no surprise if we agree that nasality may vary both in type and degree and is not necessarily a fixed phenomenon that always occurs in the *same* manner and to the *same* extent. From the listener's standpoint, we need also to make allowances for differences in background and training and in sensitivity to vocal nuances.

The amount of nasality in the voice does not seem to be *directly* related to the amount of air escaping through the nose or to the degree of opening of the soft palate during phonation. It is now rather generally recognized that some individuals manage to *sound* 'nasal' without any nasal emis-

*Claude E. Kantner (Ph.D., Wisconsin) is a member of the faculty of the School of Dramatic Art and Speech, Ohio University, Athens. This article has been adapted from a paper recently presented to the Ohio Speech and Hearing Association.

sion of air and, conversely, that some individuals speak and sing with the soft palate partly open and have no *apparent* nasality. It does appear to be true that if the soft palate is left open far enough, a nasal quality is almost inevitable. How far is far enough appears to be a variable distance. However, *there is no reason to believe that the amount of nasality in the voice increases and decreases in direct proportion to the size of the opening into the nasopharynx.*

It follows then that any device which measures the amount of air escaping through the nose cannot be relied upon to *detect* nasality and is not an accurate *quanitative* index of nasality.

It also seems to follow that there must be more ways than one to achieve nasality; that is to say, the factors of resonance that we recognize as nasality can be added to the voice by structures other than the soft palate. This is recognized by some writers, as is also the observation that the apparent nasality in the voice is sometimes accentuated and sometimes obscured by other vocal factors, particularly pitch, volume and tension. Leaving the soft palate open during phonation is undoubtedly one of the chief ways of adding nasality to the voice, but we must recognize that this process does not inevitably result in nasality and that similar acoustic effects can be produced in other ways and by other structures in the resonating mechanism.

These considerations lead us to wonder whether nasality can be detected consistently or measured quantatively by a device of the type that picks up sound vibrations from the nose either by bone or by air conduction. The answer is, probably not. Some of our confusion may arise from the term 'nasality' which leads us to assume that this quality must necessarily issue from the nose. Could not the overtones that are recognized as nasality issue from the mouth or the top of the head? If so, such devices will on occasion fail as detectors of nasality. Further, there is reason to believe that such an instrument, if sensitive enough, will always pick up sound vibrations off the nose and even from the air issuing from the nostrils. If this be true, then, even in those cases in which the nasality is the result of excessive resonance in the nasal cavity, it cannot be said that the presence or absence of nasality depends upon the presence or absence of vibrations in this cavity. Rather, *it must depend either upon the type or the intensity of such vibrations.* Once this is admitted, we are left to determine subjectively the point at which these vibrations change in type or intensity sufficiently to warrant application of the term *nasality.* Such devices may also fail us as indicators of the *amount* of nasality. In the first place, they pick up indiscriminately all vibrations to which they are sensitive and have no power to select out any particular overtones that might be responsible for nasality—even if we knew which overtones were so responsible. A possible alternative, of course, is to assume that any sound vibrations picked up from the nose or from the air issuing from the nostrils represents, *per se,* nasality. However, if this assumption is made and if the previous observation that such vibrations are probably present in all speakers is correct, it seems to follow that nasality as a subjective phenomenon becomes apparent only when certain characteristic overtones or overtone relationships reach a certain degree of intensity. This is plausible, but it immediately raises the question as to whether or not there is any reason to believe that the degree of nasality varies proportionately with intensity. If it did, then doubling the volume of a nasal voice, other factors being held equal, should double the amount of nasality. Instead it seems more nearly to double

the apparent loudness of the degree of nasality that was there in the first place. In other words, the nasal quality does seem to vary in degree more or less independently of intensity. Thus, in the second place, it is difficult to understand how a device that can register only in terms of intensity can be relied upon as an accurate indicator of the amount or degree of nasality.

This brief discussion has doubtless raised more questions than it has answered and, if it seems to suffer more from obscurity than profundity, it should at least point up the need for a more objective definition of nasality based on a more thorough experimental delineation of its nature. Some of the possible applications of these lines of thought will be apparent in the remainder of this article. For the present purposes, two simple conclusions may be drawn:

1. Nasality in cleft palate cases cannot be dealt with intelligently on the basis of an assumption that it is simply a matter of first repairing the soft palate and then learning to use it to open and close the nasopharyngeal port.

2. There are many devices for 'showing nasality' that are very valuable as teaching devices, or motivators or 'convincers.' We must, however, be wary in using these in diagnosis as *detectors* of nasality and recognize that, for the present at least, the human ear is the final detector and arbitor. We must be doubly cautious in using them to measure the amount of nasality or the rate of progress in overcoming nasality. With this background, let us now consider some of the problems involved in examining and diagnosing cleft palate speech.

I

For the sake of convenience, let us think of the diagnostic process in terms of three general steps: (1) observation of the speech patterns, (2) examination of the speech organs and (3) consideration of the case history. No attempt will be made to cover each of these steps in full detail. Instead, I shall fill in the general outline and elaborate from time to time on points of special interest.

In examining a new case my own habit is to begin by observing his speech, first in the casual give and take of getting acquainted and establishing confidence, and later in reading, or in word and sentence repetition, or in a picture articulation test. The initial problem is to get the individual to talk freely, and this is not always easy with cleft palate cases, particularly with small children. I have never discovered any secret formula, but I have learned a few things to avoid. Since the very nature of cleft palate usually means operations, hospitalizations, numerous visits to doctors, clinics, etc., the speech clinician is often greatly handicapped if he is known to the child as 'Dr. So and So,' or if his dress or manner or office in any way suggests a medical doctor to the child, or if he is located in or near a hospital or medical center. In general a casual, unhurried, friendly approach seems to be better than a brisk, professional one. A good rule of thumb is never to try to push the examination along any faster than the child is ready to go. A premature attempt to get him to talk or to open his mouth for an oral examination may result in a point-blank refusal that makes further cooperation difficult to secure. The success or failure of some interviews depends also upon the examiner's decision as to whether he should make his first conversational approach directly to the child or to the parent or other adult who accompanies him. This is a decision that must be made quickly in the few seconds between the time when the child first appears at the door and the time when it is necessary to 'say something.' It is not always safe to assume that a seeming-

ly extroverted and well adjusted child will respond to an immediate overture. Instead it may frighten him into silence. On the other hand, some timid children grow more bashful and less inclined to speak with delay and, if some response can be secured at the very beginning, it may 'break the ice' and insure a successful examination. The writer does not pretend to be a master of this art of knowing the right way and the right time to approach each individual child, but it is an important aspect of the diagnostic examination.

Assuming that we do get the individual to talk freely, what do we want to know about his speech? Obviously, we want to know whether or not his voice does have a nasal quality and, if so, how much. Further, we want to observe whether this nasality seeems to vary considerably from time to time or to remain quite consistent in degree. We will want, if possible, to try him out on isolated vowels, nonsense syllables, single words, and simple sentences spoken in a very slow and deliberate manner in order to see if his voice quality in this type of vocalization differs from that of his ordinary casual speech. Eventually we are going to have to try to estimate how much of his present nasality is 'habitual,' in the sense that it results from insufficient use of the soft palate within the limits of its present capacity, and how much is caused by a physical inadequacy of the soft palate. The former nasality, we have reason to hope, can be largely eliminated with proper motivation, sensitization and training in slow and careful speech.

In dealing with that portion of the nasality which is still on an organic basis we will again need to estimate sooner or later how much can be eliminated by training or surgery designed to improve the structure or functioning of the soft palate and how much is likely to remain as a permanent, residual nasality because of an irremediable insufficiency of the palate. We must not make the mistake of assuming that all cleft palate nasality is *per se* organic nasality. On the contrary, much of it is not based on any current organic condition but rather upon habits formed earlier as the result of some previous condition that is now corrected. These two types need to be distinguished and the amount of each estimated. Treatment often fails, or is needlessly prolonged, because the clinician treats one type of nasality as if it were the other, or because he does not know when improvement ceases to be a matter of overcoming bad habits and becomes a problem of securing an actual increase in the functional capacity of the soft palate, or because he does not know when maximum functioning of the soft palate within the limitations of its structure has been reached. (There is no intent here to overlook the role of the pharyngeal muscles).

Our next step might well be to make an inventory of articulation. We are again interested in differentiating between those defects that are the direct and logical results of the cleft palate and associated deformities in the hard palate, teeth and lips and those that are the result of other causes that are either unrelated or only indirectly related to the cleft palate. Mixed in with those articulatory symptoms that can logically be attributed to the cleft palate, one frequently finds others that are more characteristic of a general speech retardation or of a hearing loss. One may even find foreign dialect or a baby-talk lisp, since these people are not rendered immune to other types of articulatory defects by virtue of their cleft palates.

Having sorted out those articulatory problems that can be properly ascribed to the cleft palate and associated deformities, we shall again want to distinguish between those

of this group that are the result of current anatomical conditions and those that are habitual in the sense that there is no present physical reason why the individual can not make the sound properly. This can best be done in conjunction with the oral examination. To give one specific example, it is important to know whether the *k* sound is defective because the person cannot make a closure between the back of the tongue and the palate or cannot build up pressure for the sound because the air escapes through the nose, or whether it is defective because he got into the habit of making it defectively before his palate was repaired. The examiner will find it well worthwhile at this point to take the time to make detailed and precise notations of all articulatory defects and variations. If we are careful not to over-dichotomize, these can profitably be listed tentatively in three groups as follows:

1. Those that seem to have been caused largely by conditions or factors other than those related directly to the cleft palate.

2. Those that are probably in the main a direct result of the cleft palate condition but have no present anatomical barrier to their proper production.

3. Those that are defective because of some current physical anomaly. This latter group may then be subdivided into those sounds that can probably be improved or corrected in spite of the existing condition and those that probably cannot be improved until the underlying physical condition has been corrected.

Only two of the many other items that might be observed in this first step of the diagnostic examination will be mentioned here. We should watch for undesirable accessory movements of the nostrils and lips during speech. These movements should be noted for possible future correction, and it has sometimes seemed to the writer that they may serve as a hopeful prognostic sign in that, in the absence of previous training, they tend to occur in those cases who have some awareness of their abnormal speech and are making at least an unconscious effort to conform to more normal speech patterns. Often, however, such movements appear to have resulted from over-zealous, if not too wise, speech training.

We should also note the level of development of vocabulary, sentence structure, etc., disregarding so far as possible nasality and articulation in an effort to judge the general development of speech as a whole. Otherwise, we may discover later that while we were thinking and working in terms of cleft palate speech, the primary problem was a general speech retardation.

II

It is now time, however, to ask our case to open his mouth and say *Ah* so that we can look inside and begin to relate what we have observed in his speech to the physical condition of his speech mechanism. Looking first at the upper lip, and assuming that it too was cleft and repaired, what observations should we make? Let me say first that I do not believe that the upper lip is particularly important as an articulator. It plays a relatively passive role or makes only gross movements in a few of the most easily made sounds in English. By far the most important consideration to the case is the appearance of the lip. He wants a lip that looks normal in size and contour and is free from unsightly scars. If such a lip is also flexible and functions well, so much the better, but if it should be more or less inflexible, the effect on his speech will be relatively slight. However, if the upper lip is thin and stiff and drawn tightly back over the upper teeth, it will not only give the person an unsightly appearance, but it may also make it impossible for him to

bring the upper and lower lips together properly for the labial consonants. Similarly, a V-shaped notch on the red margin of the lip at the site of the scar may cause difficulty with the lip plosive sounds. In summary, the questions to ask concerning a repaired cleft lip are: (1) Could its appearance be improved by further surgery? (2) Could its function be improved by exercise or massage? (3) Are there any irregularities or deformities that will actually interfere with the production of the bilabial sounds?

Turning now to a consideration of the condition of the teeth and jaws, we find ourselves faced with one of the two most baffling aspects of diagnosis in cleft palate — namely, the problem of determining the extent to which certain specific sounds are defective because of certain specific abnormalities in these structures. If the original cleft involved the alveolar ridge, we find that irregular teeth, missing teeth, extra teeth, teeth especially subject to decay, crowded teeth, poor bite, protruding upper jaw, etc. are the rule rather than the exception. Even when there has been no cleft through the upper gum ridge, there is likely to be a narrow and high hard palate with resultant crowding, irregularity and protusion of the upper teeth. Surely here are conditions that should be sufficient to account for defects in the articulation of at least a dozen of the important consonant sounds. Yet most of us have doubtless seen a number of cases with the worst possible dental conditions who somehow managed, without any special training, to produce all consonant sounds quite acceptably, with the possible exception of *s*. Without taking time to probe this problem in detail, let me state briefly a few general principles that I have come to believe will usually hold true:

1. We need to be very conservative in deciding that a certain consonant is defective *because* of a particular anomaly of the teeth or jaws that may happen to be present.

2. The three conditions that seem most likely to have a direct and inescapable effect on articulation are: (1) a marked protrusion or retraction of either the upper or lower jaw, (2) a marked open bite, and (3) wide spaces between, or marked irregularity in, the upper central teeth.

3. Any one of four other factors, namely, general intelligence, motivation, keenness of hearing and muscular agility of the tongue, is probably usually more important than the condition of the teeth in determining the ultimate effect of teeth and jaw anomalies on articulation.

4. More specifically, an attempt to appraise the relationship between anomalies of the teeth and jaws and articulatory defects cannot be complete without at least a parallel appraisal of the muscular coordination of the tongue and the integrity of the hearing mechanism.

5. The cumulative force of habit is probably often more important than the physical condition of the teeth in explaining the *persistence*, if not the presence, of a given articulatory defect.

6. We need to be very conservative in assuring a child or his parents that straightening the teeth or having a dental plate made will materially improve speech.

7. There will be relatively few times when we can say dogmatically that this particular anomaly is making this sound defective and must be corrected before we can hope to achieve a passably correct sound. In most instances, a more reasonable attitude to take is that these teeth and jaw anomalies impose an additional handicap on the case and make adequate articulation more difficult for him. A removal of the physical ob-

stacles should make speech correction easier but will by no means insure success.

8. In general, given good intelligence, good motivation, an agile tongue, keen hearing, and proper training, most cleft palate patients can achieve reasonably passable—not necessarily perfect—articulation regardless of the condition of the teeth and jaws, and this seems to remain true, in general, even if the individual cannot make a complete closure with the soft palate.

For our purposes, the examination of the hard palate can be discussed rather briefly. I have never found much reason to believe that it makes a great deal of difference in speech whether the hard palate itself is smooth or rough, narrow or broad, high arched or low vaulted. It does, of course, make a difference if and when the condition of the hard palate affects the functioning of the soft palate or the development of the teeth—which often happens. Concerning the hard palate itself, about the best we can say is that irregularities in its shape or surface may necessitate some compensatory movements in articulation, but that these are relatively simple in comparison with those required in adjusting to dental and jaw anomalies.

Something should also be said about the openings that sometimes remain in the hard palate following surgery. These are particularly likely to occur when the cleft has been wide, the tissue scant, and the surgery difficult, with perhaps two or more operations required. Under such circumstances the surgeon may hesitate to recommend another operation unless it seems quite necessary, and he may ask the speech correctionist's opinion as to the effect of the opening on the patient's speech. One answer is, I think, that any opening that is not large enough to inconvenience the patient in eating by allowing food and liquids to enter the nose is probably not large enough to cause any appreciable nasal quality. However, some patients with large openings—as large or larger than a lead pencil—may learn to chew and swallow in such a manner as to avoid leakage into the nose. Should openings of this size be closed for the sake of speech? The answer here would seem to depend upon the condition of the patient's soft palate. If his soft palate is structurally and functionally good enough that he can make—or learn to make—a complete closure, then an opening of this size might add enough nasality to his voice to be noticeable and prevent him from acquiring non-nasal speech. On the other hand, if there is already a strong nasality caused by a definite structural inadequacy of the soft palate that probably cannot or will not be remedied, there is little reason to believe that the closure of an opening of this size in the hard palate will reduce the nasality enough to be noticed.

We come now to the examination of the soft palate and surrounding structures. This is the most difficult and yet the most vital part of the physical diagnosis. It is difficult because we must evaluate both the present and the potential functional capacity of the soft palate, and it is vital because our program of training and the individual's ultimate progress in achieving non-nasal speech will be determined to a large degree by the condition of the palate. First of all, we are not too much interested in the appearance of the soft palate. Not infrequently a palate that has been skillfully repaired from the standpoint of appearance so that it looks a great deal like a normal palate proves quite inadequate for speech purposes. Conversely, some repaired palates that present a very bad appearance function surprisingly well. We are very much interested in the distance between the soft palate and

the back wall of the pharynx—in other words, in the distance that the palate has to move in order to effect a closure. We are also much interested in the degree to which the palate tissue is stretched or relaxed in a resting position and somewhat interested in the thickness or thinness of the repaired tissues and the amount of scarring.

The important consideration is, of course, *how well does the soft palate functon?* For speech purposes the ultimate goal of surgery on the soft palate is to enable the person to close off the nasopharynx. The function of the palate in effecting such a closure can only be evaluated in relation to the surrounding structures, namely, the tonsil and adenoid tissue, the posterior and anterior pillars, and the pharyngeal walls. The first question to be answered is: Is the individual able *at present* to close off the nasopharynx? Can he blow against pressure, for example, or swallow vigorously a large mouthful of water without leakage into the nasal cavity? If he can do this, the next question is: *Does he make such a closure with any degree of consistency in speech?* The answer to this last question lies largely in his speech. If his voice shows little or no nasality, we have no problem, or at least a very hopeful prognosis. We may assume for practical purposes that a closure or near-closure is being made. On the other hand, if his voice shows considerable nasality, we shall want to know whether or not air is escaping through the nose during phonation. If it is, we will usually be safe in assuming that he is nasal because he is not making a complete enough closure of the entrance into the naso-pharynx. If by chance we should not be able to detect any escape of air from the nose during periods of nasality, we may need to look elsewhere than the soft palate for the cause.

Most often, of course, even the case who can make a closure will show both nasality in his voice and a leakage of air through the nose. The question then becomes: Is he *potentially* capable of learning to close off the naso-pharynx *during speech?* This is by no means the same as asking whether or not he can make a closure. The mistake is often made of assuming that because the palate is adequate for one function, it is therefore adequate for all other functions, including speech. The statement sometimes made that, if a case can blow up a balloon without losing air through the nose, he can under proper circumstances be taught non-nasal speech is simply not true. Adequacy of the palate for blowing up a balloon is not at all equivalent to adequacy for speech. In blowing up a balloon, the muscular effort is strong and sustained; in speech the closure and opening must be done rapidly and alternately and with a minimum of effort. The only real test of palatal adequacy *for* speech is adequacy *in* speech. If the patient can produce isolated vowels or single words, or nonsense syllables containing voiceless plosives non-nasally with relative ease, it is a good sign that he may be able with training to achieve speech that is free from nasality in slow and careful utterance—possibly even with normal fluency. Even so, we must remember that it is still a far cry, neuromuscularly speaking, from the palatal action in the utterance of a single vowel to that in casual speech.

Apart from speech, some indication of the adequacy of the palate may be obtained from the individual's ability to do 'easy blowing' without losing air through the nose. 'Easy blowing' here means exercises such as blowing steadily against the flame of a candle without putting it out. It is a particularly hopeful sign if the person is able to alternate blowing through the mouth and blowing through the nose without nasal leakage during the periods of oral emission. If the case can meet some or all

of these requirements, we can proceed on the assumption that his soft palate is functionally adequate for speech and that his nasality is largely due to habitual, insufficient use of the palate and set up our program of training accordingly.

In many cases, however, there will be no clear signs that the palate is adequate for speech. Perhaps the person is not able to make a closure under any circumstances or can do so only with such effort that the outcome, so far as speech is concerned, is doubtful. We are then forced to estimate the *potential* capacity of the palate *with training*. The question now is, can this palate through exercise, massage, etc., be given enough additional strength, flexibility and movement that it will be reasonably adequate for speech? *It is not enough to feel fairly certain that we can secure some additional movement.* One may work six months with good results so far as additional movement is concerned, only to find that the person is as nasal as ever because he is still too far short of getting a complete closure to make any noticeable difference in his nasality. The important point to remember is that, *given a wide opening into the nasopharynx, it is actually the last part of the movement toward a closure that counts most heavily.* Additional movement of the palate and pharyngeal walls sufficient to close off a fourth, a half, or even three quarters of the opening will have little effect on the nasal quality of the voice *so long as there remains a rather large opening that the person cannot close.* The question then is not, can the individual get additional movement, but rather, *can he get enough additional movement to bring him within at least striking distance of a complete closure?*

On what basis does one answer such a question? The main factors to be considered are: the size of the opening into the nasopharynx, the degree of shortness and tenseness of the soft palate, the amount of the present movement of the soft palate and pharyngeal walls, the size and relationship to other structures of the tonsil and adenoid tissue, the amount and nature of previous training, and such general characteristics of the person as his intelligence, motivation, and perseverance. In some cases, it will be possible to say positively that the palate is hopelessly inadequate, the opening being so large and the palate so short, tense and scarred that no amount of exercise will ever enable the individual to make even a near-closure. If so, palatal exercises are a waste of time, although there may well be work to be done on other phases of voice or on articulation. Such a case should then be considered as to the feasibility of an obturator or of surgery to lengthen the palate. In many instances, however, the issue will be in doubt and can be resolved only by a trial period of training.

It has been suggested previously that the tonsils and adenoids need to be taken into consideration in evaluating the functioning of the soft palate. This is a matter in some dispute. Some plastic surgeons insist that under no circumstances short of acute menace to the person's health should the tonsils and adenoids be removed. They feel that a repaired palate is always of necessity somewhat less efficient than a normal palate and that the tonsils and adenoids do assist in closing off the nasopharynx. Others seem to ascribe very little importance to these structures and may even remove the tonsils as a routine part of the repair of the soft palate. My own feeling is that it is a good general rule in these cases to leave the adenoids in whenever possible because of their location and the assistance they may give in partially blocking off the nasopharynx in cases with a palatal insufficiency. The question here revolves around the extent to which the adenoids do serve to pre-

vent the free passage of air into the nasal cavity, and it seems reasonably certain that in some instances, at least, this factor does make an important difference in speech. This opinion has been strengthened by the observation of certain cases who seemed less nasal than the condition of the palate would lead one to expect. Following removal of the adenoids, there was a marked increase in nasality which apparently could not be overcome. The significance of such observations is, however, somewhat obscured by the fact that the tonsils are usually removed at the same time.

The case for the tonsils is less certain and in any event must be decided on a different basis, since here the important consideration is the extent to which the tonsils, by virtue of their size, shape, and position, are assisting or impeding the palate and pharyngeal walls in effecting a closure. I have seen some cases in which it was felt that the tonsils were assisting in the closure and others in which they seemed to be in the way and actually making closure more difficult.

Each case apparently needs to be decided on an individual basis after a careful appraisal of the functional relationship of the structures. It also appears that in some uncomplicated clefts where skillful surgery is done at an early age, the results may be so good that the tonsils and adenoids cease to be an important consideration.

Several references have been made to the importance of pharyngeal movement. It seems evident that when the soft palate is moderately short and inadequate the final outcome with respect to speech often depends upon the amount of pharyngeal movement that the individual is able to develop. There is much that we do not know as to why some cases develop extensive pharyngeal movement without any special effort or training—at times even when it seems to be of no avail so far as speech is concerned—while others seem unable to achieve any great degree of movement no matter how carefully trained. It is also doubtful if we really have any very specific techniques for teaching or stimulating pharyngeal movement in contrast to palatal movement.

Except for a few techniques such as direct stimulation of the pharyngeal wall, we seem to rely largely on the same procedures that are used to develop movement of the palate. The writer has also been unable to discover any particular clues that are useful in predicting probable success in learning pharyngeal movement, beyond such very general factors as intelligence and motivation. It has been observed that the presence of some movement is often of great help in developing additional action. On the other hand, those cases who show little or no pharyngeal movement sometimes seem either to be incapable of learning or to have great difficulty in getting the idea. Once a beginning is made, some cases progress quite rapidly.

Although there are many other important considerations that must be ignored, this section on the physical examination of cleft palate cases should not be closed without commenting that no such examination is complete without a test of hearing, since these cases are especially subject to hearing losses. There is also a greater need for periodic checks on hearing, since rather wide fluctuations are not uncommon.

III

The third main step in diagnosis involves a consideration of the case history. We want to find out about the extent of the original cleft, the number of operations and the ages at which they were performed, the general developmental and health history of the individual and, in particular,

whether or not he has been subject to ear infections. We also need to know when he developed speech and something of his progress in speech up to the present. Information about his family background is often significant, as is whether or not his parents or those caring for him have an intelligent understanding of his problems. We want to know the individual's own attitudes toward himself, his handicap, and also the attitudes of those around him. We should by all means have a check on his intelligence that is as accurate as possible and an estimate of his developmental level if he is at the preschool level, or of his achievement level if he is in attendance. We need to know what plans, if any, have been made for further surgery or medical or nursing care and of any special plans for home or foster home care.

IV

After we have observed his speech, examined his speech mechanism, and learned the pertinent facts in his case history, we should be ready to decide what is to be done for the case. Our immediate responsibility is his speech. Does he need speech training? Can he profit by it? How intensive, how long, and what type of training should he have? What can we reasonably hope for in the way of progress in speech? Can satisfactory arrangements be made for training? These are some of the troublesome questions that we will have to try to answer. We are, I believe, at the same time obligated to express our opinions, albeit humbly and with all seeming deference, as to the indivdual's need for further surgery, general medical or dental or nursing care, orthodontia, prosthodontia, or welfare supervision.

A brief statement about the general prognosis in these cases is in order. It must of necessity be general, because to prognosticate intelligently in an individual case requires information on all or most of the matters that have been covered as well as others that have not been touched upon. It is my belief that many of the children who are now being born with cleft palates will achieve normal or near normal speech—often without any need for speech training. A great deal of credit is due the plastic surgeons who are continually developing better techniques that give more satisfactory operative results. Even more credit should be given to the federal, state, and local public health agencies that have been largely responsible for locating cases of cleft palate, starting medical care soon after birth, and seeing to it, when the time comes for repair, that the child is placed in the hands of a skilled surgeon regardless of the financial ability of the family. Most of the severe examples of cleft palate speech that we now find are seen in adults or older children. The prospects are good that a majority of the children born with cleft palates in 1948 will grow up with good speech or with speech only mildly defective as to nasality and articulation.

There will, however, in all probability always be work in this field for the speech correctionist, and, no doubt, there will always be some cases for whom the speech correctionist must admit regretfully that he can do little or nothing. There is no point in deceiving ourselves with false optimism that we can achieve worthwhile progress with every cleft palate case. Some, by dint of their own efforts or through training, will already have progressed as far in speech as they are capable of progressing, simply because they do not have and cannot be given a functionally adequate mechanism for speech. Others—and these are the ones that cause us the most pain—could be helped, but the obstacles to proper medical care and speech training imposed by lack of facilities, by religious prejudices, emotional malad-

justments, impossible environmental or family situations, etc., are so hopelessly entangled that despite our best efforts we are forced by circumstances to look on helplessly while a child slips into a thwarted and useless maturity—knowing all the while that if our resources had been greater or better organized a social liability could have been turned into an asset. There is still a third class of cases who are so deficient mentally that training cannot be justified because of the limited end-results. We should be fully aware of the need for extreme caution in discarding a child as hopelessly feeble-minded, yet I have found no reason to doubt that there are such cases. If there is any doubt, the child should by all means be given the benefit of a trial, but once it is clearly established that his capacity is severely limited we should discontinue or limit our training accordingly. Certainly we should not allow our sympathy for this type of case to blind us to our even greater obligation to the many with more normal potentialities who are still being sadly neglected.

Our goal for every person with a cleft palate should be to make available the best possible speech training commensurate with his needs, his physical limitations, his mental ability, and his potential contribution to society. It is my impression that we in speech correction are much farther from achieving this goal than the medical profession and the public health agencies are from reaching their goal of complete medical and surgical care for every child born with a cleft palate.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 223

The Speech Correction Foundation

Wendell Johnson*

THE Foundation is still in its first year of actual operations, but already a few facts and tendencies have become quite clear. First of all, it has become most evident that the Speech Correction Foundation is with us to stay. The first few days of infancy, so to speak, have been safely passed, and the baby is showing a normal, steady gain in weight. It is a likely expectation that growth will proceed gradually, without spectacular spurts, but in a way that will call forth from old friends of the family an occasional, 'My, how Junior has grown!'

Members of the Association will undoubtedly be interested in some of the observations that seem clear enough for comment. Perhaps the main one at this time has to do with the various types of resources available to the Foundation. Our early planning took into account the basic principle of coordinating fund-raising procedures with the Foundation's purposes. For example, if the Foundation were devoted to the purpose of paying the costs of speech correction for individual children—which it is not—it would seem best to raise funds in such a fashion as to leave the major share of money in local communities.

This sort of fund-raising program, however, is not well suited to the Foundation's purposes. Professional training programs and scientific research cannot be carried on equally well in all communities. Money used to support such purposes must be distributed unevenly, therefore, much being spent in those centers where training and research can best be accomplished, and little or nothing being spent in areas where there are no facilities for such work. This means that fund-raising based on strictly local appeals is not the best kind for the Foundation to use.

There appear to be two chief sources of funds available to a Foundation such as ours. The first is made up of individuals who are sufficiently interested in speech correction to want to lend support to its development. Only a very few of these individuals are wealthy; the Foundation is not going to be built with thousand-dollar bricks, but with thousands of dollar bricks. The grass roots of the Foundation will be made up of persons who have speech defects, who have had them, or who are parents, relatives, teachers, employers, or close friends of speech-handicapped children and adults. These are the people who know what the problem is and feel the importance of it. They *want* to know about the Foundation. They *want* to give money to it. The most important thing every Association member can do is to tell them about it, at every opportunity.

The other chief source of potential funds is made up of the large, established foundations and organizations with philanthropic programs. This is a source, however, which will develop slowly and only if and as the Foundation works out specific research projects or scholarship programs on which substantial sums can effectively be spent. This kind of support will come only after the Speech Correction Foundation has established itself as a going concern.

We can all help the Foundation most by simply talking about it to the folks who want to know about it and who want to be a part of it. They are legion, and that is why the Foundation will grow, with our helpful watchfulness.

*Wendell Johnson (Ph.D., Iowa), Editor of the *Journal*, is Professor of Speech Pathology and Psychology and Director of the Speech Clinic, University of Iowa. He is Chairman of the Foundations Committee of the American Speech and Hearing Association.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, 13, 224-226

Infant Speech: The Effect of Family Occupational Status and of Age on Use of Sound Types

Orvis C. Irwin*

IN PREVIOUS REPORTS (5, 2) analyses of the speech sound status of infants have been made in terms of age norms. The problem of sex differences also was reported (5, 2). A further study was done on the differences between the speech of young infants living in an orphanage and those living in their own homes (1), and another which treated the speech sound status of low grade feebleminded children (3). Another report compared the speech sound status of only infants and infants with siblings (4). The purpose of the present article is to consider two other variables, parental occupational status and age, on the speech sound development of infants under two and one-half years of age.

The present report will be concerned with an analysis of the effect of these variables upon the infant's mastery of phoneme types. A subsequent article will deal with their effect upon the infant's frequency of utterance. The term *type* refers to an elemental speech sound while the term *frequency* refers to the number of times each of the various sound types occur. The comparison will be made between two groups of infants. One of these groups was reared in families the fathers of which were laboring men, either skilled or unskilled. The other group of babies was from business, clerical, and professional homes.

The data for phoneme types are presented in Table 1 which includes the number of age levels, the number of infants, and the means for each group. It should be read: for the first bimonthly period there are 47 infants from non-laboring groups with a mean of 7.2 sound types, and 15 infants from laboring groups with a mean of 7.1. It may be noted in the table that the differences of the pairs of means from the 8th age level (15-16 months) to the last age level consistently favor the non-laboring group.

Equations have been derived from the data of Table 1. The equation for the means of the groups of infants from non-laboring homes is $P_T = 7.8\ A^{0.467}$, while that of the children of working people is $P_T = 8.3\ A^{0.410}$. Theoretical values were calculated from each equation, and the curves determined by them have been plotted in Figure 1. Age is laid off on the x-axis and the number of speech sound types on the

TABLE 1. Means for type, two groups.

Bimonthly Period	*Non-Laboring*		*Laboring*	
	N	*Mean*	*N*	*Mean*
1-2	47	7.2	15	7.1
3-4	62	11.1	18	11.4
5-6	59	12.1	16	12.9
7-8	49	14.9	15	15.7
9-10	47	16.6	15	14.1
11-12	48	19.3	14	16.4
13-14	46	18.8	11	19.1
15-16	43	20.6	12	19.8
17-18	39	21.3	11	20.2
19-20	30	23.3	11	20.4
21-22	29	23.4	8	21.6
23-24	23	24.9	8	23.0
25-26	24	26.5	8	23.9
27-28	17	26.4	7	25.4
29-30	13	28.1	6	25.2

*Orvis C. Irwin (Ph.D., Ohio) is Research Associate Professor of Psychology and Child Welfare, State University of Iowa, and an Honorary Fellow of A.S.C.A.

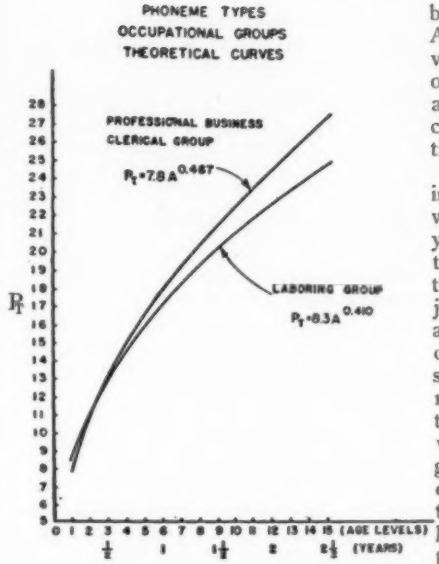
PHONEME TYPES
OCCUPATIONAL GROUPS
THEORETICAL CURVES
PROFESSIONAL BUSINESS
CLERICAL GROUP
$P_t = 7.8 A^{0.467}$
LABORING GROUP
$P_t = 8.3 A^{0.410}$
P_t
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 (AGE LEVELS)
½ 1 1½ 2 2½ (YEARS)

FIGURE 1. Theoretical curves derived from means of phoneme type production of groups of infants from laboring and non-laboring homes.

y-axis. The curves are parabolic arcs and illustrate a tendency toward a slower rate of development for infants in the homes of workers, especially during the last year of infancy.

The problem to be considered is whether the tendency apparent in the curves is statistically significant. The procedure which was followed was to test first for the homogeneity of variance about 15 pairs of means, then to make an analysis of variance of the means over all 15 age levels.

The results of the Bartlett test for homogenity of variance (**6**, 99) are shown in Table 2 which gives the corrected Chi-square and P-values for the 15 pairs of type distributions. The table indicates that none of the Chi-square values are significant at the 5% level of confidence and thus that the pairs of distributions may be assumed to be homogeneous.

It remains to test whether the null hypothesis holds for the differences between the means of the two groups. A multiple criterion design for the variance analysis was used, namely occupational status and age. In this analysis, the numbers in the subclasses are corrected for disproportionality.

The result of this analysis is shown in Table 3. The analysis of variance with correction for disproportionality yields F-ratios which indicate that interaction is negligible, that occupation is significant at the 5% level and just short of the 1% level, and that age is significant at the 1% level of confidence. It can therefore be assumed that the null hypothesis may be rejected. Furthermore, when an F-test was run on the last six age levels where all values for the laboring group are smaller than those for the other group, occupation was found to be significant well beyond the 1% level of confidence, and age was found to be significant just short of the 1% level. The F-test on the first nine age levels, however, shows that the occupational factor is not significant at the 5% level.

There is also the question as to whether the differences between the means of the laboring and non-laboring homes may not be due to differences among the subgroups. Are there significant differences among the type means among the business, clerical and professional groups on the

TABLE 2. Test of homogeneity of variance for 15 pairs of type distributions.

Bimonthly Periods	*Corrected Chi-Squares*	*P*
1	1.597	.20
2	0.472	.50
3	0.947	.40
4	0.155	.70
5	0.395	.85
6	0.617	.40
7	1.169	.25
8	1.067	.30
9	1.009	.90
10	0.672	.40
11	1.528	.20
12	1.057	.30
13	0.324	.55
14	2.481	.10
15	0.868	.45

TABLE 3. Analysis of variance for types in two groups—15 age levels*.

Source	*df*	*SS*	*V*
Age	14	23,332.51	1,666.07
Occupation	1	113.96	113.96
Interaction	14	197.32	14.09
Within Subclasses	722	12,491.90	17.30
Total	751		

Interaction: $F = \frac{14.09}{17.3} = 0.81$, df = 14, 722 not significant

Occupation: $F = \frac{113.96}{17.3} = 6.59$, df = 1, 722 5%

Age: $F = \frac{1,666.07}{17.3} = 96.3$, df = 14, 722 1%

*Corrected for disproportionality of numbers in subclasses.

one hand; and on the other, between the means of infants from skilled and unskilled laborers' homes? In neither case was the F-ratio found in be high enough to reject the null hypothesis at the 5% level of confidence. The differences characterize the two major groups and do not occur among the subgroups within them.

In view of the foregoing analyses it seems proper to assume that the null hypothesis for differences in occupational status, that is, between babies of laboring and of non-laboring parents, may be reasonably rejected. It would seem, then, that the curves in Figure 1 illustrate a tendency toward differences due to occupational status of the families in which these infants are born and reared. The occupational component, however, is not effective until the last year of the infant period. Age differences within the two groups are likewise significant.

SUMMARY

Speech sound data collected on two groups of infants, one including children from homes of laboring families, the other from homes of business, clerical, and professional people, were analysed in terms of phoneme type. The mastery of speech sounds for the two groups was found to proceed at different rates. The equation for phoneme type development of the babies in working class homes is $P_T = 8.3\ A^{0.410}$, while that for the other group is $P_T = 7.8\ A^{0.467}$. Analyses of variance yield F-ratios indicating significant differences between the two groups, especially for occupational status during the last year of infancy. Age differences within each group are likewise significant.

REFERENCES

1. BRODBECK, ARTHUR and IRWIN, ORVIS C. The speech behavior of infants without families. *Child Developm.*, 1946, **17**, 145-156.
2. IRWIN, ORVIS C. Development of speech during infancy: Curve of phonemic frequencies. *J. exp. Psychol.*, 1947, **37**, 187-193.
3. ———————. Developmental status of speech sounds of ten feebleminded children. *Child Developm.*, 1942, **13**, 29-39.
4. ———————. Speech sound development of sibling and only infants. *J. exp Psychol.* (Accepted for publication.)
5. ——————— and CHEN, HAN PIAO. Development of speech during infancy: Curve of phonemic types. *J. exp. Psychol.*, 1946, **36**, 431-436.
6. LINDQUIST, E. F. *Statistical analysis in educational research.* Boston: Houghton-Mifflin, 1940 .

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 227-232

Neurophysiological Clues to Auditory Acuity

Leo G. Doerfler*

THE advantages of a test of auditory acuity in which responses are not contingent upon patient cooperation are manifold. In addition to the utility of such a test in helping to determine true auditory threshold and the presence of malingering and psychogenic deafness, there might also be the possibility of ascertaining the presence or absence of hearing in very young children. This would of course be of inestimable value in terms in planning the educational program of an aurally handicapped child.

With these aims in view, the following tentative criteria were set up to determine the feasibility of the tests which are presently available.

1. The test should yield a measure of threshold acuity. That is, it should be possible, within reasonable limits, to determine the threshold of sensitivity for frequencies within the audio range.

2. The test should lend itself to comparatively rapid analysis. Tests which require extended examination of the results after the test period has ended tend to lose vital flexibility which is often essential in the testing of difficult or atypical cases.

Preliminary examination indicated that there were four neurophysiological measures which appeared to offer some possibility of affording a measure of auditory acuity. These were: heart rate, respiration rate, electroencephalograph, and galvanic skin response.

Soon after preliminary work was begun, it became apparent that the first two techniques, heart and respiration rate, would not be satisfactory, since they did not appear to lend themselves to the exactness and flexibility which was felt to be required. The electroencephalograph appeared to offer more promise, but upon further experimentation it became apparent that the electroencephalographic records were inordinately complex and unwieldy and required excessive analysis after the testing was completed, thus precluding the rapid analysis mentioned previously as being indispensable for flexibility. In addition, the electroencephalographic results often did not yield a threshold measure which could be reliably interpreted.

The galvanic skin response showed the most promise of giving a true picture of auditory acuity and was settled upon as the method to be used in the study.

There has been some experimentation with the use of the galvanic response as an indicator of the presence of hearing. Michels and Randt (**7**), in a recent issue of the *Archives of Otolaryngology*, report an attempt to use the galvanic skin response to verify diagnoses of malingering and psychogenic deafness. They used tuning forks and the spoken voice almost exclusively, however, and were interested primarily in cases of ap-

*Leo G. Doerfler (M.S., Washington) is Assistant Professor of Audiology and Director of the Audiology Clinic, School of Medicine, University of Pittsburgh. This article has been adapted from a paper presented at the 1947 convention of A.S.H.A.

Acknowledgment is made to Dr. Donald B. Lindsley, Department of Psychology, Northwestern University, for his assistance in guiding this study and his supervision of the use of equipment.

parent total hearing loss. Redlich (8), reports the use of the galvanic skin response in the diagnosis of hysterical anaesthesia, but there has apparently been no attempt to utilize the galvanic skin response to measure the actual level of auditory acuity.

In the experimentation to be discussed in this article, the Grass electroencephalographic apparatus was employed. This consists essentially of resistance-capacity coupled amplifiers, with ink-writing oscillographs. The apparatus employs a time constant of about one second, thus making it possible to record slow phenomena. Four amplifiers and four ink-writers were used, making it possible to record both electroencephalographic and galvanic skin responses simultaneously or to record one type of response through two or more channels at the same time, using varying amounts of attenuation in each channel to facilitate interpretation.

Because of the nature of the amplifiers, the true magnitude of the first swing of the oscillograph ink-writers is recorded, but it is not possible to utilize reliably the remainder of the return of the ink-writer to the base line. However, the advantages of such a system are great, since the ink-writer always returns to the same base-line, regardless of any change in the resistance of the subject, etc., thus eliminating the necessity of continually rebalancing the equipment in order to keep the responses on the recording paper. In this experiment the interest was primarily in a response which would correlate highly with the auditory acuity of the subject, and not in the resistance presented by the subject.

This type of equipment records what is known as the *Tarchanoff effect*, the actual electromotive force which is generated between the two electrodes, presumably by the action of the sweat glands. The apparatus has a very high input impedance, which results in its not being affected by changes in the subjects' resistance. Measurements of resistance were made, however, for record purposes.

Two electrodes of the conventional zinc type were attached by means of electrode jelly and adhesive tape either to the palm of the subject or to the palm and back of the hand.

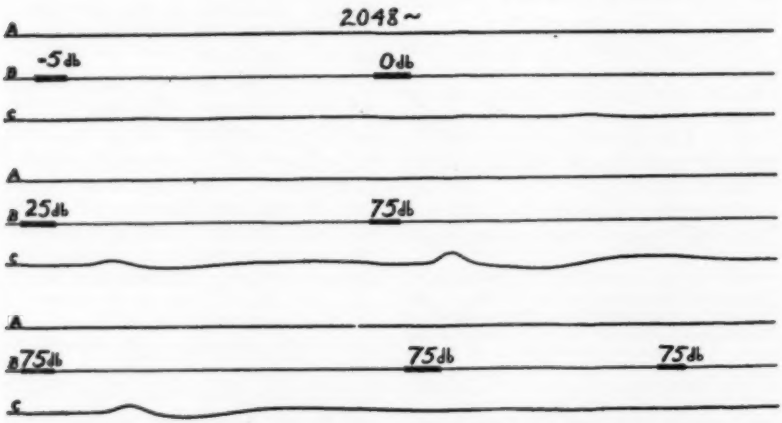

FIGURE 1. Illustration of adaptation to pure tone auditory stimulus. Solid lines in Channel B indicate duration and intensity (above normal threshold) of tone. Channel C indicates patient's galvanic skin response. Note early galvanic skin response, with adaptation virtually complete after third stimulation at 75 db.

The subject was seated in a comfortable chair in a darkened room which was electrically shielded. All of the apparatus, with the exception of the electrodes and the audiometer receiver, was outside the test chamber. The auditory stimulus utilized was a Western Electric 2A (battery operated) audiometer, with the receiver fastened to a headband and held securely to the subject's ear through the use of a dummy receiver.

Because of the exploratory nature of the investigation, the procedure employed varied somewhat from subject to subject. Several subjects were instructed to respond by depressing a telegraph key when they heard a tone, it having been previously ascertained that the depression of the key did not in itself produce a galvanic skin response. Other subjects were told that they would hear tones of varying frequency and intensity but that they were to do nothing.

After the first few subjects were tested, two facts became apparent. In many subjects there appeared the complicating factor of adaptation. In other words, the subject would give a good response to the first few stimuli administered, and then repeated stimulation would give no reliable response. Also, subjects varied tremendously in their responses, some responding perfectly down to their thresholds of sensitivity, as measured by audiograms taken with the same audiometer immediately after testing, while other subjects often gave no consistent response even at intensities well above threshold.

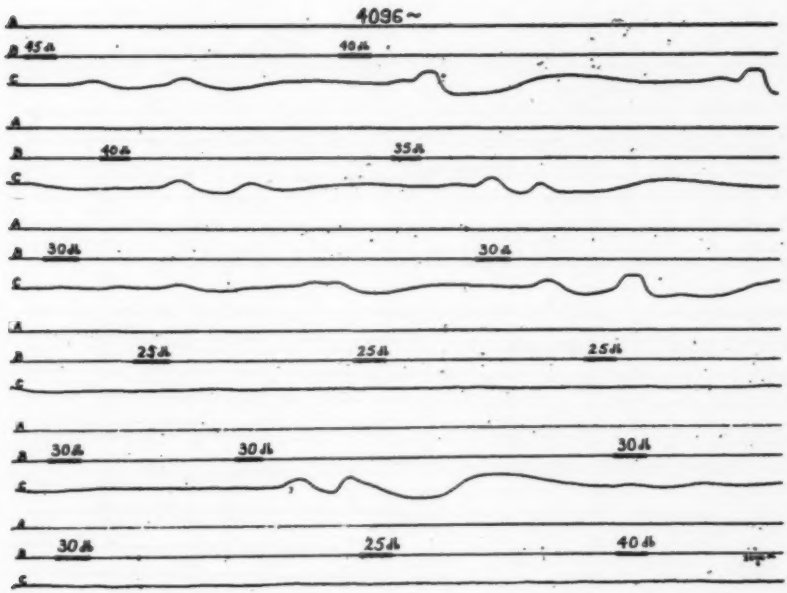

FIGURE 2. Illustration of the use of the galvanic skin response in detecting lowered auditory acuity at a single frequency. Solid line in Channel B indicates duration and intensity (above normal threshold) of tone. Channel C indicates patient's galvanic skin response. Note use of descending intensity technique, with no galvanic response below 30 db. Patient's audiometric loss at 4096 cycles was recorded at 30 db. Also note adaptation toward end of series at supra-threshold intensities.

The first problem, that of adaptation, appeared to be overcome to a large extent through the use of an ascending rather than a descending intensity technique, accepting the subject's first response to the frequency being tested as his threshold for that frequency and going on immediately to the next frequency. Although this method probably resulted in a slightly higher threshold, it was felt that this was not a serious error.

The second problem, that of subject variation, was a more serious one. Several of the non-responsive subjects complained that it was very difficult for them to keep concentrating upon listening for the tones. One of them, in fact, almost fell asleep. It was felt that some sort of attention-mobilizing device was needed, one which would warn the subject of an impending stimulus tone and would also allow him to relax between stimuli. The device decided upon was the use of a small flashlight bulb, mounted in a bracket on the wall about eight feet in front of the subject. This light was put into the circuit with one of the ink-writers, so that the period of time when it was lit was automatically recorded.

At first the subjects were told that the tone would be sounded only when the light was on, but complications arose when the galvanic skin response resulting from the turning on of the light became confused with the response to the auditory stimulus. Much more satisfactory results were achieved when the light was turned on for a warning to the subject that the

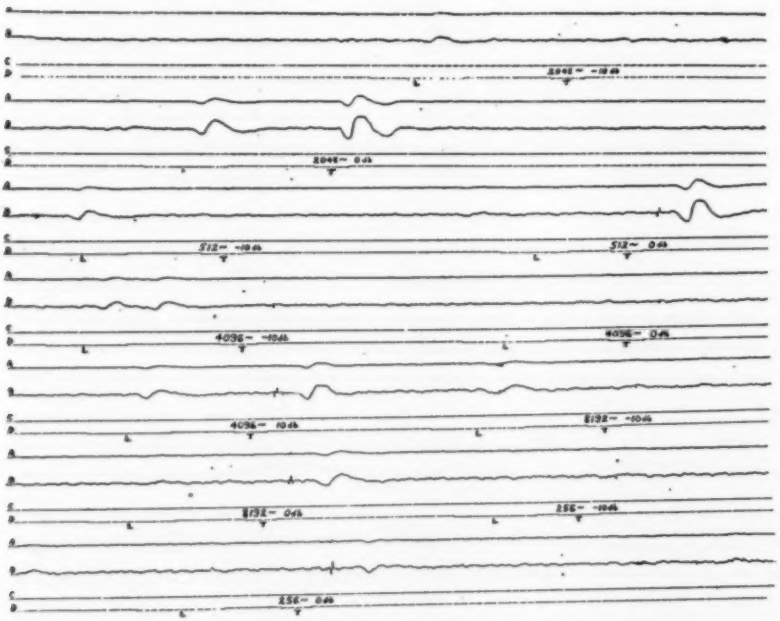

FIGURE 3. Illustration of the tracing of a virtually complete audiogram (5 frequencies) by means of the galvanic skin response. Channels A and B indicate galvanic skin response at varying attenuator settings. Depressions in Channel D marked 'L' indicate duration of mobilizing light signal, those marked 'T' indicate duration of tone of indicated frequency and intensity (above normal threshold). Ascending intensity technique used, with steps of 10 db.

auditory stimulus would be presented sometime within a period of eight seconds after the light went out.

The subjects all had substantially normal hearing, as measured by audiograms taken after the test period. In the case of one subject, the presence of a dip at 4096 cycles was picked up by the experimenter without previous knowledge of its existence.

The object of this experimentation was to determine whether the galvanic skin response afforded a measure of auditory acuity. If such appeared to be the case, the experimentation was to be continued, in an effort to determine whether it would then be possible to draw the audiogram of a hard of hearing person in a manner similar to that employed in testing the normal hearing subjects. This would be the next logical step.

The ultimate aim of this type of experimentation is to achieve some means of testing the hearing of suspected psychogenically deaf persons, in order to get a measure of their true hearing. There is some belief, gleaned from research at Deshon General Hospital, that emotionally charged speech material, administered at intensities below avowed threshold, may result in a more reliable galvanic skin response than pure tone stimuli, but the evidence is meager. In any event, it may be indicated that the galvanic

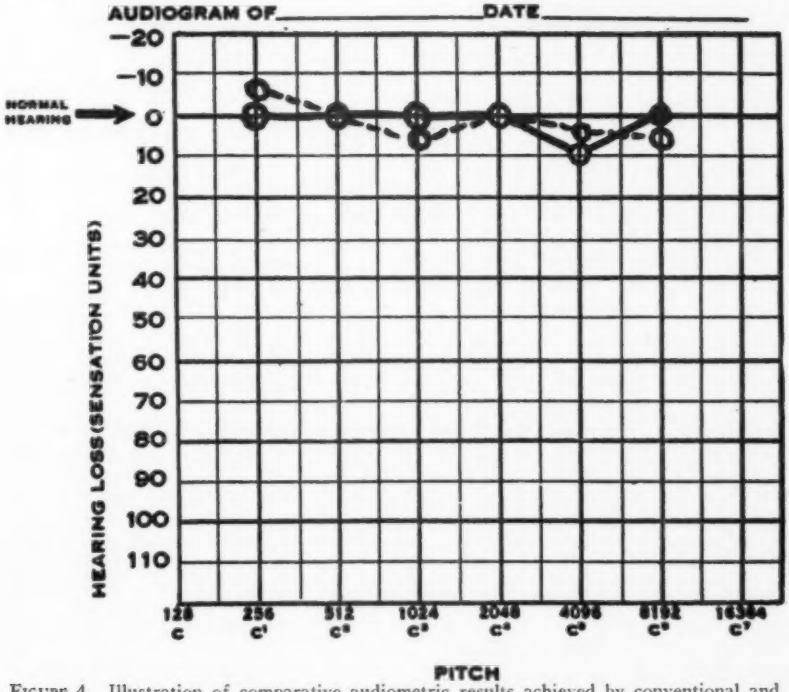

FIGURE 4. Illustration of comparative audiometric results achieved by conventional and galvanic skin response techniques. Solid line indicates galvanic skin response audiogram. Dotted line indicates conventional audiogram taken immediately following experiment. Ascending intensity technique used in both tests, 10 db steps used with the galvanic skin response.

skin response offers a promising means of ascertaining auditory acuity without the necessity of patient cooperation and without any knowledge of the results on the part of the patient.

References

1. Bakes, F. P. Effect of response to auditory stimulation on the latent time of the blocking of the Berger rhythms. *J. exp. Psychol.*, 1929, **24**, 406-418.
2. Coombs, C. H. Adaptation of the galvanic response to auditory stimuli. *Psychol. Bull.*, 1937, **34**, 558.
3. Durup, G. and Fessard, A. The electroencephalogram in man. Phychophysical observations relative to the action of visual and auditory stimuli. *Année Psychol.*, 1936, **36**, 1-32.
4. ———— and ————. The electroencephalogram in man. Quantitative data on blocking caused by visual or auditory stimuli. *C. R. Soc. Biol.*, 1936, **122**, 756-758.
5. Landis, C. Psychology and the psychogalvanic reflex. *Psychol. Rev.*, 1930, **37**, 381.
6. ———— and Forbes, T. W. Investigation of methods of measurement of electrical phenomena of skin. *Psychiat. Quart.*, 1933, **7**, 107.
7. Michels, M. W. and Randt, C. T. Galvanic skin response in the differential diagnosis of deafness. *Arch. Otolaryngol.*, 1947, **45**, 302-311.
8. Redlich, F. C. Organic and hysterical anaesthesia: A method of differential diagnosis with the aid of the galvanic skin response. *Amer. J. Psychiat.*, 1945, **102**, 138.
9. Spiegel, E. A. and Sommer, I. *Neurology of eye, ear, nose and throat.* New York: Grune & Stratton, 1944.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 233-235

An Analysis of Wood's Articulation Index

Ernest H. Henrikson*

WHAT constitutes 'progress' for a person who is working on a speech problem? This question is difficult to answer, particularly since the speech deviation is likely to involve the person as a whole, and because performance will vary somewhat from time to time and from situation to situation. In spite of the difficulties involved, the question can not and should not be avoided. Degree of progress, however defined, will surely be a major criterion for determining the value of remedial procedures. Furthermore, the more specific the criteria of progress can be, the more valuable they may be, assuming, of course, that the criteria are valid and reliable. But criteria are not necessarily desirable just because they are specific. It is the purpose of this study to examine one means of measuring speech progress which has been presented recently.

In 1931, Travis (**1**) presented a rank order of frequency of the use of consonant sounds by children in casual conversation. He indicated the number and percentage of times each sound occurred. Wood (**2**) used the Travis frequency table as a basis for determining the progress of a group of children with functional articulatory defects. 'The actual "articulation index" was determined by giving a relative weight to each sound and prorating that weight equally to the positions in which the sound occurs. For example, since the relative weight of [f] is 2.4 percent according to the Travis table, then initial, medial and final [f] are given a weight of .8 percent each. If a child is unable to say some of his sounds correctly, the weight values of these sounds are subtracted from his total score. His articulation index would be the sum of relative weights of the sounds he misses subtracted from 100.' (**2**, 225)

This study is not concerned with the question of the validity of using the frequency-of-occurrence index as a measure of progress. Nor does it deal with the problem of whether or not Travis' percentage frequency table is applicable to the group of children tested by Wood. This investigation considers only one question: do sounds occur in children's speech in equal frequency for each position in which they occur? This was assumed by Wood, although he presented no evidence to justify his prorating.

Procedure

The speech of three individual children and two groups of children was recorded and analyzed.[1] The three individual children were: M, age 6; J, age 7; and C, age 12. The groups of children were: (1) a group of third grade pupils (mean age 8 years), 12 of whom took part in the discussions recorded, and (2) a group of eighth grade pupils (mean age 13 years), 14 of whom engaged in the discussions recorded. This number of students and the amount of material

*Ernest H. Henrikson (Ph.D., Iowa) is Associate Professor of Speech and Assistant Director of the Speech Clinic (Office of the Dean of Students) at the University of Minnesota.

[1]The author wishes to express his appreciation to Dr. Mildred Templin, Assistant Professor in the Institute of Child Welfare, University of Minnesota, for her assistance in collecting and compiling the material for this study.

recorded are not assumed to be sufficient to supply normative data for the frequency of occurrence of sounds in various positions for children of different ages, types, and so forth. That, however, was not the problem of this study. The relevant question is: is a prorating based on an assumption of the same frequency of occurrence for various positions justified?

The frequency of occurrence of each sound in each position was noted (observed frequency), and this was compared with the frequency expected (theoretical frequency), according to Wood's postulate that the total occurrence of the sound can be divided by the number of positions in which it occurs, usually three, in order to determine how often the sounds actually do occur in each position. Comparison was made on the basis of the hypothesis of equal probability, using the Chi-square test.

Results

Table 1 records the results obtained when the frequency of occurrence of sounds in various positions for the group studied is analyzed. The table indicates that most con-

Sound	*Observed Frequencies*				*Theoretical Frequencies*	*Degrees of Freedom*	χ^2	*P*
	Total	*Initial*	*Medial*	*Final*				
t	1923	449	410	1064	641	2	411.5	.00
n	1385	180	716	489	462	2	312.6	.00
r	1143	119	533	491	381	2	272.1	.00
s	899	410	177	312	300	2	91.1	.00
d	798	285	100	413	266	2	186.2	.00
l	723	167	310	246	241	2	42.6	.00
x	630	570	45	15	210	2	921.6	.00
k	627	219	218	190	209	2	2.6	.20–.30
m	606	286	115	205	202	2	72.4	.00
z	483	9	38	436	161	2	707.0	.00
p	473	216	171	86	158	2	55.2	.00
w	446	394	52	0	223	1	262.2	.00
h	410	404	6	0	205	1	386.5	.00
b	361	271	83	7	120	2	307.7	.00
g	347	264	42	41	116	2	284.6	.00
j	314	297	17	0	157	1	149.7	.00
v	288	9	84	195	96	2	182.5	.00
f	279	177	36	66	93	2	118.7	.00
ŋ	274	0	57	217	137	1	93.4	.00
θ	153	91	44	18	51	2	53.6	.00
dʒ	126	100	12	14	42	2	120.2	.00
tʃ	114	69	19	26	38	2	38.6	.00
ʍ	97	94	3	0	48	1	86.3	.00
tʃ	13	0	8	5	4	1	.84	.30–.50
ʒ	13	0	8	5	4	1	.84	.30–.50
	12962	5101	3309	4552				

Table 1. Comparison of the observed frequency of positional occurrence of consonant sounds with the theoretical frequency which would result if the sounds occurred equally in each position in a word.

sonant sounds do not occur equally in all positions in a word. For only three sounds, [k], [tʃ], and [ʒ], can the difference observed be assumed to be caused solely by sampling fluctuations, and these sounds make up only 5.33% of the total sample. That these groups were comparable with Travis' group, on which Wood based his postulated prorating, is evident in the fact that the rank order correlation between the relative sound frequencies in the samples from the two groups was very high ($\rho = .97$).

Conclusions

Under the conditions and within the limitations of this study as described above, it would seem reasonable to conclude that:

1. The rank order of frequency of occurrence of consonant sounds in children's speech presented by Travis corresponds approximately with the order of occurrence found in this study.

2. Prorating consonant sounds on the assumption that they occur equally or approximately equally in all positions in a word is not justified.

3. Using such a prorating as the basis for constructing an index of progress is not justified, and the value of conclusions drawn from using such an index is correspondingly questionable.

References

1. Travis, Lee Edward. *Speech pathology.* New York: Appleton, 1931.

2. Wood, Kenneth Scott. Parental maladjustment and functional articulatory defects in children. *J. Speech Disorders,* 1946, **11**, 255-275.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 236-240

Evaluating the Efficiency of Group Screening Tests of Hearing

Hayes A. Newby*

SINCE THE WAR, hearing conservation programs have increased in importance throughout the country. Speech correctionists can well be gratified at the emphasis educators are now placing on the hearing of school children. It can reasonably be expected that in the near future practically all school systems of any size will conduct periodic surveys of the hearing of their pupils. As the hearing conservation program gains momentum, more and more dependence will be placed on group screening tests of hearing as a rapid means of separating those with a significant degree of hearing loss from those with 'normal' hearing.

While it is certainly desirable that screening tests be employed in the interests of economy of time and effort, there is danger that those conducting hearing surveys will place too much confidence in their screening tests. A blind reliance on the screening test without knowledge of how efficiently the test is operating may result in the survey's failing to discover a considerable number of impaired ears or in the needless retesting of a high percentage of normal ears. Either result is, needless to say, highly undesirable and serves to weaken the confidence of the general public in the hearing conservation program.

The purpose of this article is to explain a simple technique which can be employed to study the efficiency of a group screening test. The writer has used this technique only with a group pure tone screening test (**1**), but it is adaptable as well to group phonograph speech screening tests.

In judging the performance of a group test of hearing, the existence or absence of 'significant' hearing losses among the subjects tested must be determined by individual pure tone tests. The number of subjects found on individual tests to have significant losses will, of course, depend upon what criterion of significance is employed. Newhart and Reger (**2**) advocate the practice of designating as 'significant' a loss of 15 decibels (db) for any two frequencies tested. The writer has found in his testing experience with school children that a more practical criterion is a loss of 20 db for any two frequencies or a loss of 30 db for any single frequency for either ear.

In assessing the efficiency of a group screening test, it is obviously impractical to test individually all the subjects tested with the group equipment. A policy of sampling must be employed. In examining the efficiency of a group pure tone screening test, the writer followed the practice of testing individually every fourth child on the teacher's grade roll in each grade screened with the group equipment. The more subjects tested individually, the better the measure of efficiency obtained. It is the writer's feeling that for an over-all estimate of the screening test's efficiency

*Hayes A. Newby (Ph.D., Iowa) is Assistant Professor, Department of Speech and Drama, Stanford University. This article has been adapted from a paper presented at the 1947 convention of the American Speech and Hearing Association.

TABLE 1. The tetrachoric table.

		INDIVIDUAL TEST	
		% showing significant loss	% showing no significant loss
GROUP TEST	% showing significant loss	*a*	*b*
	% showing no significant loss	*c*	*d*

no fewer than 50 subjects—or 100 ears—should be tested individually. These 50 subjects will, of course, be distributed through the various grades in which the group test has been administered. If it is desired, the efficiency of the screening test at each grade level can be studied. In the case of a grade-by-grade analysis of the group test's performance, the writer recommends that a minimum of 25 subjects—or 50 ears—be tested individually at each grade level. A convenient way of estimating screening test efficiency at various age levels is to combine grades. For example, the writer found it useful to combine the eighth and seventh grades, the sixth, fifth, and fourth grades, and the third and second grades.

Once the results of the required number of individual tests have been obtained—and it is desirable that the same person administer all these tests—the examiner is ready to evaluate the efficiency of the group test. He does this by comparing the individual test result with the group test result for each subject tested individually. A convenient method of graphically examining the data thus obtained is the use of what statisticians refer to as the 'tetrachoric table.' This table is not used in the present instance to obtain a coefficient of correlation, but merely to portray the data in a meaningful fashion.[1] Table 1 illustrates the standard form of a tetrachoric table.

For convenience, let us designate the four squares of the table as cells *a*, *b*, *c*, and *d*. Percentages entered in cells *a* and *d* indicate agreement between the group test and the individual tests. In the case of cell *a*, both tests indicate a significant hearing loss; in the case of cell *d*, both tests show no significant hearing loss. or, in other words, 'normal' hearing. Percentages entered in cells *b* and *c* indicate disagreement between the group and the individual tests. In the case of cell *b*, the group test shows a significant loss while the individual test shows normal hearing; and in the case of cell *c*, the group test shows essentially normal hearing while the individual test indicates a significant loss. The percentage entered in cell *c* is most damning of the group test's efficiency, since this percentage represents subjects with actual hearing losses who have been passed as 'normal' by the group test. The percentage entered in cell *b* represents extra labor on the part of the examiner—subjects whose hearing (as measured by the individual test)

[1]The writer is indebted to Dr. James F. Curtis, Associate Professor of Speech, State University of Iowa, for his suggestion of the tetrachoric table as a technique for studying group test efficiency.

is normal, but who for some reason failed the group test and so in actual practice would be referred for a follow-up individual test.

Now if the group test should miraculously turn out to be perfect in efficiency, cells *a* and *d* will add up to 100 per cent of the ears involved in the survey, and cells b and c will each be zero. Such efficiency, however, is but theoretical. In practical use, according to this writer's opinion, if cells *a* and *d* together contain 75 to 80 per cent of the total ears and cell *c* contains less than 5 per cent of the total ears, the group test may be considered reasonably efficient.

The efficiency of the group test is directly related to the criterion of 'significant' hearing loss employed with the group test. It is possible, by lowering the criterion of significance sufficiently, to reduce the percentage in cell *c* to zero. The effect of this maneuver, however, will be reflected in a greatly increased percentage in cell *b*. Now since the efficiency of the group test is measured both in terms of how well it correctly classifies impaired ears and how well it classifies 'normal' ears, the efficiency of the test is decreased by reducing the percentage in cell *c* at the expense of that in cell *b*. It is of course desirable to reduce the percentage in cell *c*, but in lowering the criterion to move cases from cell *c* to cell *a*, a point is reached when the law of diminishing returns operates to move an inordinately greater number of cases from cell *d* to cell *b* for every case moved from cell *c* to cell *a*. The examiner must decide where the criterion of a significant hearing loss should be placed for maximum efficiency of the group test to result. Once this criterion is established, it presumably will be used throughout future group testing, if the group test proves to be satisfactorily efficient.

Perhaps the use of the tetrachoric table to determine the optimum criterion of significance can best be explained by setting up a hypothetical example. Let us suppose that we are trying to discover the best criterion to employ in order to secure the greatest efficiency from a group phonograph speech audiometer test. We have both group and individual test results for 100 ears, and we have decided on the basis of previous experience that a loss of 20 db at any two frequencies or 30 db at any one frequency shall constitute a 'significant' loss on the individual test. Now the problem is to define a 'significant' loss on the group test. It will be necessary to score the group papers for the 100 ears at least three times in order to observe the group test efficiency at various criteria of significance. Suppose that the three levels of significance on the group test employed in this experiment are 9, 6, and 3 sensation units (S.U.), respectively. After each scoring, the group papers are compared with the individual papers, and the results of the comparison are entered in the form of the tetrachoric table.

Table 2 shows the efficiency of the group test which results from using each of the three criteria of significance. In the upper section of the table where the criterion of significance is a loss of 9 S. U. on the group test, the test is correctly classifying 79% of the ears (cell *a* plus cell *d*). But 7% of the total ears are passed as normal by the group test when, according to the individual tests, they exhibit significant losses (cell *c*). This is an undesirable loss of efficiency of the group test.

When the criterion of a 6 S. U. loss on the group test is applied (the middle section of Table 2), we find that the percentage of ears correctly classified has decreased to 76%, but at the same time the number of impaired ears missed by the group test has decreased to 4%. The decrease in cell *c* has been accomplished by increasing the percentage of normal ears needlessly retested (cell *b*). A

TABLE 2. The effect of changing the criterion of significant hearing loss on the efficiency of a group hearing test.

		INDIVIDUAL TEST	
		% showing significant loss	% showing no significant loss
GROUP TEST (9 S. U.)	% showing significant loss	5	14
	% showing no significant loss	7	74
GROUP TEST (6 S. U.)	% showing significant loss	8	20
	% showing no significant loss	4	68
GROUP TEST (3 S. U.)	% showing significant loss	10	36
	% showing no significant loss	2	52

comparison of the upper and middle sections of Table 2 discloses that reduction of the criterion of significance from 9 S. U. to 6 S. U. results in the discovery of an additional 3% of the total ears which show impairment and the needless retesting of an additional 6% of the total ears. Thus, for every two ears needlessly retested, one more impaired ear is discovered. This is a worthwhile investment of the examiner's time, even though the superficial efficiency of the test, in terms of the number of ears needlessly retested, has been decreased.

When the 3 S. U. criterion of significance is applied (bottom section of Table 2), the number of ears correctly classified is decreased to 62%. Only 2% of the total ears are now misclassified as normal by the group test, but the number of normal ears needlessly retested has increased to 36%. Comparing the middle and the bottom sections of Table 2, we see that reduction of the criterion of significance from 6 S. U. to 3 S. U. results in the examiner's having to retest 8 normal ears for every additional impaired ear discovered by the group test. Inasmuch as the examiner is now retesting individually almost half of the total ears, reduction of the criterion of significance to 3 S. U. has resulted in an undesirable loss of efficiency.

Examination of the three sections of Table 2 indicates that in this hypothetical example the group test is operating at best efficiency—for discovering impaired ears and for cor-

rectly classifying normal ears—when the criterion of significance employed is a loss of 6 S. U. Use of the criterion of 9 S. U., while resulting in a higher percentage of ears correctly classified, causes a loss in efficiency through failure to discover enough impaired ears. Use of the criterion of 3 S. U., while reducing the number of undiscovered impaired ears to a minimum, causes a loss in efficiency through the needless retesting of a high percentage of normal ears. The criterion of 6 S. U. represents the best compromise between the two components of group test efficiency, discovering impaired ears and correctly classifying normal ears. For future testing with this group test, then, the criterion of a hearing loss of 6 S. U. would be used to differentiate between impaired and normal ears.

Once the criterion of a significant hearing loss has been properly established, it is an easy matter to judge the efficiency of any group test by means of the tetrachoric table. If no amount of juggling of the criterion of significance of the group test results in reducing the percentage in cell *c* to a reasonable minimum without raising the percentage in cell *b* disproportionately, then the group test is not operating with satisfactory efficiency. Certainly, in the opinion of the writer, the group test is not performing its job if the percentage in cell *c* is as high as 5%. And if the percentage in cell *b* climbs over 25% to 30%, the examiner will be spending so much time in needlessly retesting subjects who actually have no losses that it is questionable if the group test results in any saving of time.

The tetrachoric table is, in the writer's opinion, a useful device for determining the level of a significant hearig loss for use with a group test and for evaluating the performance of the group test once the optimum significance level has been determined. Any group screening test which is not performing reasonably well its function of separating impaired ears from normal ears is either a dangerous tool on which to rely or a waste of time.

References

1. Newby, Hayes A. Group pure tone hearing testing in the public schools. *J. Speech Disorders*, 1947, **12**, 357-362.
2. Newhart, Horace *and* Reger, Scott N. Syllabus of audiometric procedures in the administration of a program for the conservation of hearing of school children. *Suppl. Trans. Amer. Acad. Ophthal., Otolaryngol., 1945.* (Amer. Acad. Ophthal. & Otolaryngol., 100 First Ave. Bldg., Rochester, Minnesota.)

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 241-246

Techniques in the Management of Aphasics

Vivian M. Sheehan*

THE RECENT war has produced a flood of literature on the subject of aphasia as a result of a renewed interest in the effect of brain injuries and, fortunately, a new interest in the rehabilitation of those who suffered them. Now, despite diminishing popular concern for war casualties, there still remains a challenge, for the same aphasics, now two to four years beyond their initial trouble, present an even greater problem of analysis and rehabilitation.

The speech clinics, picking up where the military left off in the retraining, are discovering daily new phases of old problems, some never mentioned in earlier literature because therapy was never before so intensive nor so continuous. We are reaching a critical stage in the therapy for aphasics. By old standards these men are now ready for discharge, simply because there have been traditional solemn pronouncements that no more can be accomplished.

It is my intention in this article to present the problems of these 'advance' cases, to show what can be done to meet their needs, and to question some prevalent opinions which I believe to be unfounded.

Illustrative of the problems facing some aphasics today is the following case:

A former insurance salesman, who suffered a complete loss of speech during the war, now speaks fluently, intelligently, accurately, with only an occasional slight hesitation as he chooses the best word from a good vocabulary. When he first arrived at the clinic in the fall, several people asked him in sincere surprise why he was there. He has little paralysis left of his former hemiplegia, he drives a car, converses with apparent ease, reads, writes, spells, and calculates about as well as the average high school student.

Is there, then, any aphasia left? Unfortunately, yes. This man has difficulty using a telephone directory or dictionary, for while he knows the alphabet, he cannot make this application of it. Though he can explain things, his explanations are endless and he repeats continually, sometimes without awareness, sometimes with vague feelings that his thus-far efforts have not been adequate. Often the organization of ideas is poor, and he finds he must go back and pick up a loose thread to complete the line of thought. He is willing to assume responsibility but finds that several things in operation simultaneously confuse him to a point of withdrawal from the situation. He literally goes to bed.

He understands casual conversation and follows radio programs but cannot recall what he hears if it is more extensive, more detailed, or more important to him. Under the least pressure he becomes silent and visibly tense. He is extremely demanding of himself and humbly apologetic for errors, slips or omissions which would otherwise escape unnoticed. As yet he cannot do the

*Vivian M. Sheehan (M.A., Michigan) is Speech Therapist, Percy Jones Hospital Annex, Fort Custer, Michigan. The above article has been adapted from a paper presented at the 1947 convention of A.S.H.A.

mathematics involved in insurance figuring, although the mechanics are easy enough for him. As a result of all these things, he is frustrated, insecure, worried about himself, worried about what others think of him, and worried about the effect of all these things upon his wife and his future. Perhaps his case seems slight in comparison with the man who speaks not at all, but he is still aphasic, still unable to cope with the mechanics of living, to compete in the economic world, to participate in the social world. He is not ready for a discharge—and somethig can be done to help him to continue to improve.

Stating The Goals

For the purposes of therapy, an analysis of the specific problems of each individual, like that above, must be made in order to teach. This can be done through observation, interviewing and testing. The latter is not to be confused with the routine administration of psychometrics, which are poor indeed in providing leads for the therapist.

In describing the difficulties of the aphasic, we should attempt operational definitions wherever possible. Certain phrases which crop up frequently in psychometric evaluations incline far away from the direction of operational exactitude. Instead of using the term 'loss of total intellectual capacity' which virtually means all things to all men, it is more meaningful to say: 'This man cannot tell a story without repeating himself.'—that is, to state *the observation from which* the 'loss of total intellectual capacity' was inferred. Similarly, instead of indicating a lowered level of functioning intelligence, it is more relevant to note that the man cannot without considerable difficulty find a name in the telephone book.

Generic labels leave the therapist still asking the question, 'But what are the specific needs?' When one stays on the operational level this question has already been answered. Furthermore, this approach establishes immediate and reasonable sub-goals, which the case can understand, accept, attain, and appreciate. Such goals and not one very distant end-goal, provide motivation and permit the successes necessary to progress.

Specific Techniques

In order to show what can be done to meet problems stated thus specifically, it seems appropriate to group a number under a few general headings, and describe briefly some techniniques which have been found practical. In some instances the specific statement of the problem implies the techniques to be used. This list is by no means exhaustive—either of problems or of ways of treating them. It is presented partly as a set of suggestions to stimulate further ideas for therapy. It is likewise limited purposely to the problems of the now less severe cases—of those who can talk, but not well or adequately.

Conversation.

1. Asking questions. Difficulties usually appear in finding the word to start with or the order to use. Aphasics tend to start every sentence with the key words; in questions, these often appear last. Practice questions using the common question words, such as *how, when, what,* should be given first, questions involving change of order and use of verbs, such as *is, are, can,* and *will,* should follow.

2. Telling little incidents. Even the advanced aphasic tends to avoid relating the everyday occurrences which comprise such a large part of conversation. Following this activity in group meetings, specific assignments are given which involve telling an incident at home or to a friend. Subsequent work can grow out of reports of successes and difficulties and from

class discussion. (Incidentally, I should like to point to this as one of the problems which ordinary individual therapy and drill methods simply do not touch.)

3. Describing people. This is especially difficult for the advanced aphasic who is unable to recall the name of the person to whom he is referring. He needs practice in observing and reporting identifying characteristics.

4. Indicating locations. For example, one advanced aphasic, when asked where he kept his car, was unable to answer, because he tried to be too exact and detailed. Instead of saying merely that he had parked his car near the dormitory, he tried to name the exact street, a feat that would be difficult for many.

5. Keeping chronological order. Short speeches on 'What I did last weekend' or other topics involving time sequence help clarify this problem.

6. Presenting ideas briefly. Similar treatment, with timed speeches.

7. Coming to the point.

8. Varying responses. One aphasic expressed all affirmatives by an inevitable 'yes.' We listed cooperatively other possible ways, watched his responses in class, and gave assignments.

9. Listening to others converse. The simple requirement that the case must learn to report the conversations of other class members helps him learn to fix his attention and listen.

10. Telling something in a crowded room. Practice in a restaurant or other noisy place will help build psychological barriers to keep out distractions. Assignments to say a certain number of sentences at home with the radio on can be given.

11. Interrupting politely. This is easily practised in group classes and in outside situations.

12. Maintaining eye contact. Desirable during all speaking, important especially when experiencing trouble.

13. Using contractions. For example, saying 'I'm going' instead of 'I am going' to give a conversational tone to the speech. This involves a special difficulty in that the aphasic frequently tends to say 'I going' when attempting the contraction. Other common contractions provide equally good material for developing smooth speech.

'Small Talk'

This is a good place to make use of a practiced pattern or recurrent phrase, so that the aphasic may feel sure of his ability to say well what most people assume is automatic anyway.

1. Giving introductions.
2. Paying compliments.
3. Thanking the hostess.
4. Asking a girl for a date.
5. Commenting on the weather.
6. Greeting friends and strangers.
7. Begging pardon.

Verbal Crutches

1. Eliminating pet phrases. This includes what Head called 'the recurrent phrase.' One aphasic continually interspersed her speech with the expression 'good night!' even though able to make more meaningful comments. Pet phrases often replace or precede — as 'starters' — better responses and should be inhibited in advanced cases. This can be done by calling the use of such a phrase to the attention of its user by mentioning it within a given speech, having him mark down his use of it in a single class period, having the class say it after him, making him say it three times after each use he catches, etc. Once aware of the frequency, he can eliminate the crutch rapidly.

2. Eliminating over-used gestures. Some gestures reinforce speech; some replace even the speech attempt and

thus hinder progress. The treatment is similar to that for 'pet phrases.'

3. Eliminating substitutions. This is found in aphasics who have articulatory difficulty or who fear that they may bobble in the delivery of the word. Some aphasics seem little aware of their use of substitutions, which are obvious to others, because they actually rehearse or pre-form the difficult word first and then switch. Furthermore, the constant need to be able to find another word creates tension, or pressure, for the aphasic just as for the stutterer. Treatment is similar to that for other verbal crutches. In addition, deliberate use of difficult words (which are kept on a list) will help. Obviously, too, finding out why the difficult words are hard to say, and ironing out that problem, will do much to break down the use of these verbal crutches.

Word endings

Sounding word endings, or using the correct ones, proves difficult for most aphasics. The particular problems are: plurals; present participles, ending in *ing*; past participles, especially knowing whether to sound *ed* as *d* or *t*; and the present tense, third singular, with its change in form. Once the person is made aware of his errors (one at a time!) he can be given work both in speech and reading in class, as well as assignments to be checked by another member of class, etc.

Avoidances

1. Avoiding speaking situations. The case should first be made aware of his failure, then prepared for such difficult situations and sent deliberately into them. Small penalties should be placed on failures. Example: Ask him to report his failure and reactions to the class.

2. Letting others say it. Insist on the patient's repeating any word said for him.

'Little Words'

A very common difficulty is in supplying the necessary or choosing the correct 'little words,' such as *to, is, but, or, was, on, in, have been, from, out,* etc. Long after simple subject-predicate sentences have been acquired, these 'little words' still cause trouble, and the groping for them is responsible for much of the pausing and floundering found in the advanced cases. The word 'strawberry,' as a noun, is likely to be much easier to use than the word 'has.' Answering with phrases questions about where objects, people, and places are is valuable practice. During short talks or in conversations in class their use can be checked. Assignments to use a certain preposition as planned three times during a day can be used to secure carryover.

Specific Word Difficulties and Fears

An error box works well here. Aphasics put into it words on which they 'always' have trouble. Every two weeks or so a typed list is prepared, and time is spent in attacking difficulties. This can be followed by assignments to use those which can be said.

Telephoning

1. Using the telephone book. This may have to be preceded by work in alphabetizing. (Incidentally, how can the handling of the telephone be met except by giving the individual opportunity to relearn the alphabet?) The actual use of the telephone book can be done in class and through assignments. Penalties can be placed upon failures to use the phone book, e.g., permitting another person to look up a number, as soon as the case can manage by himself, no matter how slowly.

2. Making a call. This involves a number of steps, any one of which can be a specific assignment, but all of which the aphasic should not be held

responsible for at one time. The steps may include: dialing a number, getting a long distance number, asking for information (question), answering 'hello' or using some other difficult word at least once. Any other problem in conversation can be applied here. Assignments should be well-planned and practiced beforehand. Some should first be carried out in the presence of the clinician.

Emotional Expression

The term is used here to refer to the problem of uncontrolled emotional expression common to aphasics. Nearly all will find difficulty in voluntarily controlling laughter, for example. When made aware that this is a problem about which he can learn to do something, the aphasic usually devises personal aids for control. One man may find it helpful to look away from the immediate cause for a moment; another claims that being called upon to talk sobers him; still another finds it necessary to leave the room for awhile to regain composure. This problem is worth discussing in a group; exchange of experiences and ideas seems to help.

INDIVIDUALIZED GROUP THERAPY

Perhaps it has become apparent that these specific techniques can be carried out best if the work is done with small groups of aphasics. Many have questioned and some have even denied the value of this group therapy.

In its favor, let me present several arguments. In doing so, I am not ruling out individual therapy, for the ideal program certainly includes both. In doing so, moreover, I am not talking about chanting in a group or other ritualistic activities. I am referring to individualized group therapy, where the activities are so handled that the individuals need not be on exactly the same level of recovery or disability. The differences cannot be too great, however, or time and effort will be wasted.

Such individualized group lessons are superior because they provide real practice in such assignments and activities as have already been described. The aphasics have audiences for talks which would be meaningless in individual conferences. They help each other by checking errors, catching subterfuges, offering suggestions—all often better than the clinician's. They motivate one another, and the variety of activities possible makes taxing drills and other monotonous procedures wholly unnecessary. Learning, we need not be reminded, occurs more rapidly and surely in pleasant, alive, interesting circumstances. No clinician, no matter how clever, can spend several hours daily with one individual without growing deadly dull and very stale. Group work by its nature keeps up the interest level. Furthermore, it provides a chance for the aphasic to work openly—to allow others to see and hear his errors. In such a class he soon learns to participate, to accept criticsm and to give it tactfully, and to put into practice the things he needs to work on most.

THE FULL-TIME PROGRAM

In connection with a discussion in favor of group therapy, a word must also be said for a full program for aphasics. Their problems are so many, their handicap is so great, and their recovery so slow at best, that a half-hour or an hour a day of individual therapy seems ridiculous. Many claim that, left alone, the aphasic will recover spontaneously all that he will get back anyway. This term, 'spontaneous recovery,' is indeed widely used and badly misunderstood. In the psychology of learning it refers to the reappearance of a conditioned response following extinction of the response. By definition, reinforcing stimuli are absent during the period

of 'spontaneous recovery,' and this is certainly not the case in aphasia. As applied to the learning process in aphasia, the term is absurd, because it is the whole of language that the aphasic is learning, and he is continually bombarded with stimuli. The 'return of function' is really a result of environmental stimuli, dependent upon the nature and strength of stimuli and upon the motivation. Even though there were no clinical proof of the advisability of a full-time program, it would be logical to assume that a planned program of re-education providing stimulation, motivation, direction and guidance, as well as encouragement—all in large enough quantities to keep the aphasic working to capacity—would result in more rapid and complete recovery.

Summary

1. The aphasic can learn without the use of fatiguing drills and other monotonous activities.

2. He must work toward specific and well-defined sub-goals of achievement which he can reach within a reasonably short period of time. Let general improvement be a by-product instead of an ever-elusive goal.

3. The aphasic must realize that he cannot reach perfection. He must learn to tolerate the bobbles that occur in so-called normal speech.

4. The clinician must differentiate between the severity of the aphasia and the severity of the handicap. As is true of the stutterer, the aphasic's problems cannot be determined by 'hearing' and 'seeing' the disability itself. His level of aspiration, emotional reactions to his handicap, and the possibilities he has for satisfaction despite the handicap must be considered.

5. The clinician should teach definite phrases which can be learned and used automatically in everyday 'small talk.' This may be criticized by some as helping the aphasic acquire a superficial veneer, a 'cover-up,' but it will help him save face, put him at ease, and make further and more difficult learning easier.

6. The therapist should make every effort to reduce and simplify the task of relearning. For instance, he should not try to improve on the individual's grammar. If, before injury, the case said, 'He don't,' teach him to say, 'He don't.'

7. Keep assignments exact and specific, limited to a simple task which can be completed. The clinician must be wary of the assignment which sets such high standards of performance that the aphasic is doomed to failure.

8. The therapist must be careful not to promote competition between aphasics and must be on guard against implicit comparisons which may creep into the clinical situation.

9. Placing entire responsibility for improvement on the aphasic, as in phrases like, 'Your recovery is entirely up to you,' only adds to frustation. At best, it is unfair and untrue. Not only is the rehabilitation a co-operative venture between the aphasic and the therapist, but the burden is so vast already that the aphasic should be spared this imposition.

10. Included among the more valuable techniques in the management of aphasics are: stating the goals specifically in terms of immediate needs; specialized techniques, using questions and answers, class discussion, the assignment method, and individualized group therapy.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 247-250

Cooperation in a Public School Speech Correction Program

Thomas D. Houchin*

WITHIN public school speech correction programs, one of the most awe-inspiring aspects to first year speech correctionists, and to older professional members as well, may be the necessity for faculty cooperation in a feasible program. The speech correctionist may be secure in the fact that what he is trained to do—helping Mary say a good *r*-sound or helping Johnny work on ironing out 'th-th-this'—can have far-reaching effects on young lives in helping them to feel at ease. However, it often becomes his 'duty' to convince his associates of the value of his undertaking and to further their understanding of what he is trained to do. To that purpose, eighteen suggestions are listed below to serve as a skeletal list of 'do's' and 'don'ts' in the cooperative efforts of faculty members and speech correctionists.

1. Planned promotion of the speech correctionist's position and of his work is one of the most necessary aspects of faculty cooperation in many instances. This does not mean continuously 'talking shop,' but rather being ready to answer questions and to respond with conviction.

2. Talks of a formal nature before general faculties and informal personal visits are most vital in settling questions in the minds of the other teachers as to exactly what is the function of 'speech correction.' For instance, if, from the beginning, the 'dummy room' stigma does not become attached to the 'speech room,' the teachers will be infinitely more willing to send the brighter, as well as the more dull, children to the 'speech room' without the speech correctionist's suggesting it. In some places faculty discussion groups and in-service training sessions have been highly successful in promoting a better understanding of the speech defective on the part of the classroom teacher as well as better cooperation with the speech correctionist.

3. The speech correctionist should not pretend to be anything but a cog in the wheel of the system along with the rest of the faculty. Also, as the speech correctionist travels from school to school, it is highly important that he not be a bearer of tales. It is often well to point up at the convenient moment that the speech correctionist is paid to do what the other teachers have neither time, interest, nor training to do.

4. It is best to arrange conference times conveniently for the children in order that a child deficient in arithmetic does not miss his arithmetic period or other periods which he especially needs to attend. The teachers will appreciate the speech correctionist's eagerness to adhere to this policy.

5. The speech correction schedule, posted on the bulletin boards in the different schools, should be met at all times. Otherwise, the teachers are very likely to lose interest in the work (and not without justification). If any special conferences unavoidably interfere with the regular speech correction schedule, it is important to

*Thomas D. Houchin (B.A., Iowa) has recently resigned his position as Speech Clinician in the Fairmont, Minnesota, Public Schools to accept the position of State Speech Consultant, Minnesota Department of Social Welfare, Medical Services Unit, St. Paul.

notify the principal of the school and to explain the reason to as many as possible of the teachers of the children receiving speech correction work.

6. The speech correctionist should not presume to be the 'be-all, end-all' in speech correction. It is necessary, however, that one answer questions with a sureness that will command the respect of fellow teachers—even when the answer is, 'I don't know.'

7. Some of the best speech correctionists are known for a tactful 'offensive' for speech correction, rather than a 'defensive' attitude. A belief, perhaps a little militant, in the efficacy of speech correction will pay off in the long run.

8. One may be secure in the fact that what is done in speech correction conferences is as important as what is done in the classroom, and vice versa.

9. The speech correctionist will find it advantageous to cooperate especially with the remedial reading teacher, the school nurse, and the school psychologist. For someone new in a system, these instructors and consultants will serve a purpose of infinite usefulness in acquiring case histories and other relevant information.

10. The speech correctionist should make what he says intelligible to the general faculty member. It is essential to remember that the teachers are not speech pathology professors, but *do not talk down to them.* One of the safest rules is to explain questions with the least possible terminology.

11. To some teachers the speech correctionist will seem to be a clinical psychologist and to others a glorified phonics teacher. Here it is important to remember that it is not imperative that everyone evaluate the speech correctionist in the same way so long as he is accepted in the system.

12. The speech correctionist must not expect regular teachers to be 'errand boys' to parents. The less relaying through public school teachers who are inexperienced with speech correction techniques, the better for all concerned.

13. Conferences with the various teachers on what is being done with the children from their rooms should be held frequently. The more informal these conferences are, the better.

14. The main share of the burden in public school speech correction must fall eventually on the speech correctionist, the child, and the parent. The teacher in the classroom must not be expected in many cases to cooperate remedially at this time. Often, she has neither the time, training, interest, nor patience to cooperate in a significant sense. That, of course, depends entirely on the teacher, as *some* will undoubtedly be as 'good' as the speech correctionist himself.

15. In faculty cooperation generally, the superintendent and principals must *back* the speech correction program to present it in a favorable light to teachers, boards of education, and townspeople who are curious as to the function of the new faculty member.

16. Do not disdain the advice of the public school teacher concerning the children who come in for speech correction work. They will tell you very much in many instances about the backgrounds and classroom responses of the children that is invaluable. Accepting their help will, of course, make them realize that they are significant parts of the speech correction program.

17. The speech correctionist should not get too upset if the harried school teacher forgets once in a while to send her children down for speech correction work, and the speech correctionist has to go after them. A minute more or less will generally not make or break a life, and it may serve to make the teacher more of a loyal supporter of the speech correction work.

18. Two general bulletins of information follow such as might be sent to a faculty or parent. Obviously, however, such bulletins have to be adapted to particular situations to make them functional. They are included rather to express a point of view regarding the faculty, its place in the speech correction program, and some kinds of information which might be dispensed.

SPEECH CORRECTION PROGRAM

To the Faculties:

It ordinarily seems that if a little of something is good, then much, much more would be a lot better. And so, children in for speech improvement (once the fact is known) in many instances become targets for whom all associates like to play Dr. Freud.

Obviously, at least in the very beginning of speech re-education, nothing could be further from a good mental hygiene attitude. Speech habits, like all others—from learning to tie shoe laces on— when new, are very unstable in an emotionally loaded situation, unless the person has excellent control, indeed.

It is vital, therefore, that children not be continuously reminded to speak slowly, 'take it easy,' or to talk distinctly. Imagine what disastrous effects that would have on us all, as far as keying us up psychologically. However, over the country, well-meaning people do this continuously with no thought of the rising tensions in the child. This cannot be over-emphasized—especially in the case of rather shy children who do not seem too secure anyway. But if some 'reminding' needs to be done, it is hoped it will be made in an easy situation when the child will not be completely over-whelmed by such 'criticism,' and can be shown that you are still on his side.

There comes a time in stuttering therapy, however, when 'reminding' is one of the best ways to help a child to overcome his fear of stuttering which has been built up over the years in 'self-conscious' situations. However, that should be worked out among parents, teachers, and all who are important in the child's life and evaluations for a unified program. The attack here is not, of course, basically that of 'reminding' the lisper to speak plainly, but that of asking the child who stutters to go ahead and, for example, 'fake' stuttering as a means of directly overcoming the fear, to go ahead and experiment with you. The latter, needless to say, may well bring about an easier attitude than the child has known with you for some time.

It is supposed that all of you have heard these things somewhere along the way—not to make the child too self-conscious of the speech process, and so forth—and so this plea to 'remind' only under conditions which according to the particular child, will stlll mean acceptance on your part all the while he is valiantly working over that faulty 'r' or 's.'

PRE-SCHOOL SPEECH DEVELOPMENT

This general bulletin of information has been prepared for nurses, speech and guidance specialists, as well as for parents themselves who wonder what to do with the young child still developing speech habits. Too often these questions come from mothers and fathers who feel their child may be developing speech a little slowly, or who had a relative once with atypical speech. First, these parents must realize the perfectly normal variability and range in speech development, as in all physical, mental, and emotional development. Each community has countless 'Bobbies' who seemed to be slow to develop, but were completely 'all right' in only a few years (and perhaps with a little specialized education). What might be 'handicapping' for one child might not for another, and so forth. Then, it is most important to remember how much speech is a habit. Sometimes it seems that 'Jane' has outgrown what someone called 'babytalk,' when she has been working hard in her simple way to talk like older brother or sister. Simple ways parents and associates can help are described specifically below, for it is sad but true that all too many children do not

know how to work alone and do not happen upon the way to talk which people call normal. As a further illustration of 'speech as a habit,' we are familiar with people who, as adults, would like to overcome a problem of foreign dialect. By every standard these people are 'normal,' and yet many months of intensive analysis and drills are necessary to bring these people to the place where their speech is considered normal (for that particular region). Good examples for the very young to go by are, therefore, very valuable and absolutely necessary.

The most important suggestions to provide may be briefly summarized as follows:

(1) Be sure the child has adequate opportunity for expressing sounds and parts of words. This vocal play is extremely important as the child is trying to find out which sounds to use. Obviously the home must be an easy one in which to exercise these random speech efforts.

(2) If the child has a sound that is incorrect, say the sound alone over to the child, first without asking the child to say it. The process of imitation will take care of that. For example, if the incorrect sound is the 'letter-l,' saying 'la, la, la,' will help the child to hear and to learn the sound easily and to incorporate it in the old words in everyday speech.

(3) If the child has some words that he or she pronounces incorrectly, do not make this an item for idle joking. This latter has an effect on children very undesirable in a great majority of cases. What to do: As above, say the main sound from out the word that is incorrectly said. Do not expect the child to learn the word along with a new way to say a sound also all at once. As the child learns to sound correctly, there will be more and more transference to old words that have been said incorrectly. Well-meaning people often confuse children mercilessly by asking them to say words over and over again. That only serves to make the incorrect habit stronger. If they would take the main incorrect sound from out the word, the process would be much simpler for everyone. If the child has said 'wabbit' for ten thousand times, he will generally not say 'rabbit' the first time a grown-up says, 'Say rabbit.' He might be able to say 'r' or even 'ra, re, ri, ro, ru' if it were presented in that fashion, and finally get around to 'rabbit' easily and effortlessly. Going over pictures of words with 'r's' in them is very good for the child and to have a lot of good 'r's' said to him. There the process of learning speech by imitation and habitual use and repetition comes in again.

(4) If there seems to be any startling difference about the child's speech, (a) be sure that his physical health is good so that he will have something on which to build, and (b) take the child to an authorized hospital or speech clinic in connection with a college or university where aid will be given free or for an extremely small fee.

Above all, do not notice or become alarmed about the seeming mistakes or bobbles your young child may make in speech. He's just learning to talk.*

. As one teaches in the field of speech correction, he should keep in mind the significance of the fact that cooperation can only exist *between* the speech correctionist and other faculty members—it can never be effected alone by one member enforcing it upon the others. The isolation of the speech correctionist from the faculty (and perhaps *vice versa*) must go. The common goal for which all teachers are striving is that of producing well-informed, articulate, and useful citizens; it must be won *together* if it is to be won with the greatest success, greatest speed, and greatest economy of effort.

*The above bulletin, written by the author of this article, is reprinted from the *Minnesota Journal of Education*, October, 1947, Volume 27, page 78, by permission of the editor.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 251-255

Great Psychological Effects of a Minor Speech Defect

Alfredo Dub*

ON JANUARY 12, 1943, a young man, 20 years old, came to our clinic at the Hospital Maciel. He was very excited. When scarcely inside the room, he informed us that he could not be helped, that for years he had tried without success to improve his defect by all kinds of methods.

This young man could not pronounce the sound *l*. From the clinical point of view the defective prounuciation of *l* is not considered particularly serious, and this instance of omission of the sound would not justify a detailed report if it were not for the disproportionate consequence of it. Even more remarkable is the fact that in this case there was not substitution of another sound. The complete absence of this sound is comparatively rare. The opposite situation—in which *l* is substituted for another letter, especially for *r*—is more frequent.

In the course of relating his story, the young man told us that during his childhood he had been unable to pronounce either *l* or *r*. Strangely enough, however, he learned to pronounce *r*, which is more difficult physiodynamically, but continued to be unable to pronounce the *l*. There was no paralalia, that is, the sound was not replaced by another standard sound; in its place he utters an indefinite sound which vaguely resembles *ng*.

Another unusual fact about this case was that only the *l* sound was missing. Through testing the sounds of the alphabet separately and analyzing his use of these sounds in combination with others in syllables, words, and sentences, it was discovered that all other sounds, even those with an articular position similar to *l*, were correctly produced.

The psychological, moral and social effects of this comparatively small speech defect were extraordinary. The case told us that during his childhood his family, his friends, and his teachers had done all they could to improve the articulation of *l*. He spent approximately half an hour telling us his story in an ordinary way, intelligently, and without difficulty in expressing himself. In all this long and interesting recital, during which the patient was rather excited and could not have thought about each word, *not once* did he use the sound *l*. He had cleverly eliminated *l* from his vocabulary. This is all the more surprising because *l* has a place of preference in sound-frequency tests.

The case was then requested to write something in free composition. The following paragraphs were the result of this request[1]:

> Buenos días! ¿Qué deseaba, Señor? ¿Un equipo para afeitarse? Supongo que desea todo bueno? Barato no será, pero haremos un precio adecuado. Empezaremos por navajas. No, dos Llaves no tenemos. Son muy escasas y además han de costar de 7 pesos a 7.50. Aquí tiene Vd. dos: ésta es Mannos, y esta otra, Dos Muñecos. Tan buenas o mejores que esa Dos Llaves. No, no es por vendor que

* Alfredo Dub is Speech Pathologist in the Clinic of Otorhinolaryngology, Hospital Maciel, Montevideo, Uruguay. He also conducts teacher-training classes and does speech correction work in the Roosevel School (Institute of Crippled Children) in Montevideo. For the past three years he has also held the position of Speech Pathologist and Audiometrist for the government of Uruguay and is Head of the governmental Phonetics Department.

[1] The *ll* does not belong phonetically in the *l*-group in the River Plate pronunciation.

digo esto, pues se da garantía. Si no es buena, venga Vd. no más por acá. Su precio es de 6.50. Ya está pronta para usar. Vd. se afeita como está. No precisa asentador nir nada. Después de un tiempo, sí. Vd. mismo se va a dar cuenta que está áspera, y entonces es conveniente unas cuantas pasadas de asentador.

¿Lleva ésta? Ya va a ver cómo queda muy contento.

Aquí tiene un jabón muy bueno. Como Vd. ve, viene en potes de madera que ya sirven de jabonera. Moja Vd. su broche en agua tibia y hace espuma aquí mismo. Vd. mismo verá que es muy suave. Hace abundante espuma, no se seca y no pica. Después, hay en barra y en paquetes grandes. Pero este ya es para barberías. ¿Lleva ese? 70 centésimos. Es muy económico, pues afeitándose 2 o 3 veces por semana puede estar sequro que tiene jabón para dos años.

¿Brochas? Sí. Hay desde 15 centésimos hasta 2 pesos 80. Aquí tiene un término medio: 1.10. No es cara y muy buena. Vendemos mucho para campaña llevándose hasta ½ docena. Es cerda, y no pica. ¿ve? Se destornilla para que vea que está bien pegada. Vaya confiado en que lleva una cosa buena. Se da también garantida, pues tenemos órden de fábrica de cambiar toda brocha cuya cerda se caiga o se mueva o tenga otro defecto.

¿Tiene Vd. asentador? Vea. 40 centesimos, 60, 1 peso 20, 1.50 y 2 pesos. Sí. Este es un poco chico. Tamaño práctico es este de 1.50. No es ni grande ni chico, y con pocas pasadas asienta su navaja. Ah, sí. Como bueno, es bueno. Ya ve: pita bien seca que no encoge ni si pica. Un cuera de primera: bien terminado. Si no encoge ni se pica. Un cuero de primera: bien terminado. Si precisa pasta: aquí tiene una cajita de dos; una para pita y otra para cuero. No, nada de aceite. Se pone así como está, pues ya viene pronta. Esta es buena, auténtica, no esa imitación que hay, que es grasa, y en vez de asentar estropea. Cuesta 70 centésimos y tiene para mucho tiempo.

¿Que otra coas? ¿Gomina-brillantina-peines-cepillos? Nada mas. Bueno. A ver cuántas cosas son: una navaja, jabón, asentador, pasta, brocha: cinco cosas. Veamos cuanto suma.

From this sample it was evident that the case was able to write freely about his daily life without regard to the special selection of subject matter (the above paragraphs relate the experience of waiting on a customer in the shop) and telling everything vivaciously and clearly. Nevertheless, even in the written record there was not a single *l*.

The case told us that at one time he had used an *l* in speaking, articulating it in his own way, but because of the difficulties which this caused in his communicating with others and because he wished to avoid being laughed at, he had begun about four years previously to omit every word containing the sound—a practice with which he is now thoroughly familiar and at ease.

A speech defect, large or small, is usually accompanied by a lack of psychological balance. In the case of this young man, the psychological, moral and social disequilibrium was very great. He was asked to give a brief account of his personal history which was as follows:

[I shall begin by telling about the events from my school age, which is the earliest time I can recall.

From my fourth year on my playmates called me 'P*eng*ota ('Bang'). Why? Because when playing I used to say: 'Let's play "pe*l*ota" (ball),' and this sounded like 'pe*ng*ota.' from this I got my nickname.

Sometimes when going home from school, another boy a bit older than myself accompanied me and among other things he used to say: 'Why don't you say "Pelota-pelota" many times over and over again? Then you get used to saying it correctly.' I don't know what my answer was, but I went home repeating the word softly to myself: 'pelota, pelota, pelota.' And I had the idea that the very next day I would be able to talk all right.

With incidents like this I went through grammar school and my character began to shape with traits of ingeniousness and a touch of inferiority complex. I had a natural naive disposition and then, brought up to be generous, a very elastic judgment. No matter how hurt I felt, I never showed my feelings. All this made me inferior to others, but I preferred to

forget. I never hated anyone and till now I think I have nothing to reproach them. I still just say: we were only children.

Once the teacher brought a nice apple which he would give as a prize to the child who repeated a piece of poetry the best. I knew in my inmost-self that I was out of it, but I had every intention to win. Of what use would it be, if I could not demonstrate it? I could not be able to avoid the impression I would make on the ears of other people. Nevertheless the teacher gave the apple to me and proud and satisfied I went home with it to announce the good news to my family. But as the years went by, I began thinking that there had been some compassion in the gesture of the teacher.

At the end of the term there were always some little theatricals. I would not have been displeased to take part in one of them, but I would rather pretend I did not care. Not that I didn't. But all passed through my mind in a few seconds: I myself talking badly, the audience laughing, the other children staring at me, and at the end, absolute failure, morally and otherwise. I remember once having refused to take part in a play where I had nothing to say expect: 'Sir, they have brought the *l*etter!'

I also remember the time I won an important prize. The next day, a group of older boys wished to have a small ceremony of congratulation at breakfast. I would have been pleased to accept, not for my own pleasure, but for the happiness which it would give them if I accepted. But in this case I had to acknowledge with words. And that is why I refused in spite of the insistence of some of the boys. I was really sorry, since such an opportunity would not present itself again.

My grammar school years went by with incidents like this. I did not have to endure many jokes, but the few left behind a deep mark. I remember once playing with other children when someone said something to me which I felt like a slap on the face: 'Go and learn to speak!' Never before had my misfortune been thus crudely thrown at me. I am not a spiteful person, but in those seconds I was swept by a terrible fury and longed to disappear. I blamed myself for my misfortune. Evidently, the words had their bitter reality. But had not this person enough tact to think about what he was saying? I am not vindictive and such an idea has never occurred to me, but I would like to ask him *now*: 'Well, what about it? I *have* learned to speak!'

So came the time to enter high school. Till then I had not thought very deeply about my handicap. When I had to speak, I did it using all the words. Sometimes, when I was not understood, I had to repeat over. When I went to the grocery, people always said things to me in front of others and at last I got tired of them. I would not have gone there of my own free will any more. But as this was out of the question, I thought and thought and at last I found something. Although it was not the quickest, it was very practical and effective. The first thing I would do before going in was to see if there were any people around and if so, I would wait outside till most or all were gone. Then I would go in and stand close by the box and say to the storekeeper: 'Give me this.' When I wanted something out of view, I had to manage skillfully, in a very roundabout way: I named other things or asked prices and from then I brought the conversation to my purpose. Once there, I did not waste time and getting the storekeeper with his thoughts on the product I needed, said quickly, 'Then give me that.' I waited until there were no people around because they would stay beside the product I wanted and thus make it more difficult for me.

There was a bakery at the corner of the school, where I used to go and

ask for 'two napoleons.' At the beginning, they waited on me well, but afterwards talked to me in mocking sarcastic tones, imitating what I said, so that at the end I got tired of them. I did not stop going, but bought other buns instead of napoleons.

When I had to go to the drugstore to buy pure alcohol, I would take a slip of paper on which the word was written, but in order not to bring a 'shopping list' with just one word written on it (how could I justify this?) I had to add other unnecessary things to the list and buy them too. Thus I could say to the chemist: 'Give me this. I have it written down because I would forget it otherwise.' It was a different matter at the grocer's. Here I asked not for 'alcohol,' but for 'aguardiente' (methylated spirit).

From this time on I began to look at things from another angle. I had to keep quiet and only speak when strictly necessary. Many times I seemed dumb, ignorant or bad mannered, as I never said 'salud!' (health!) to anyone who happened to sneeze near me. Neither did I say 'Saludos!' (kind regards). I made an appropriate gesture or pretended to be absent-minded, rushed or preoccupied, allowing the others to greet me first. Another thing I longed to say was 'Merry (feliz) Christmas!' But it could never be. I had to accept this situation as I could not explain to everybody: 'Look, I cannot speak . . .'

From the first day until the moment when teachers called me at high school, I was held back by my nervousness. My difficulties began the first day, when the teacher asked for names and addresses. The first teacher didn't understand me and the class didn't realize anything. After this I had all the data written down. When I was called for the first time, to recite the lesson, it happened what I had foreseen: a certain tenseness and a silence arose. For the first time I was explaining myself saying that I had a speech defect and could not speak well. After some questions I went back to my bench. I could see what was going on in the minds of my fellowmates: they tried to look 'as if they didn't notice anything.' We considered ourselves 'grown-up'—not one of them even laughed at me. On the contrary, I shall always remember with gratitude the boy who, later on when teachers called me, went to them and whispered something which I could not catch, but could well imagine. One look or another, something in the air, told me that I was not wrong. In the following lessons the mathematics teacher allowed me to answer by writing on the blackboard.

The Spanish and French courses were terrible, especially as there was no way of avoiding them. I had to read one page or two and there was no worse torture. Sometimes the Spanish teacher gave us a dictionary to read aloud the definition of certain words. I never went in for this idea, but once I was forced to do so because the teacher himself placed it in my hands. It was as if the book was burning me and I could hardly wait for the moment when I could get rid of it and let someone else read it. It was still worse when the French teacher thought that I spoke in this way on purpose to make fun of her. The class had to intervene and she made me read several times before she was convinced. In history the teacher always said, 'Do you want to speak?' and my answer was always, 'No.' So she went on for the whole year: 'Then we will give you marks on your written work. Take pains with it.'

After all this, my favorite lesson was drawing. During this I did not have to speak, and if so, I could answer with monosyllables. So we came to the end of the term. During the examination I tried to answer the questions like anyone else, with the difference that what I said was not

understood. I passed examinations, but there were always subjects left over.

During the following year I found things easier, although I could not keep my defect from being known. I don't recall any annoying incident.

Finally, the third year was exceptional. By some teachers I was not questioned during the whole term and with others I was able to answer. So it happened that my fellow-students of that year never knew of my defect.

I had started to talk a very little by this time, had begun to speak using words with *l*, and this was a mental effort to which I was not accustomed. Later, when beginning to use more words, I also spoke more but never reached very long conversations, because when I saw the people becoming critical I changed the subject and stopped. In this way, many subjects were forbidden to me. I could not say 'phi*l*osophy' nor '*l*iterature,' 'material*l*isme' nor 'spiritua*l*isme.' Sometimes I had courage to take part in discussions, letting the others speak first. I always admired people who, meeting friends in the street, could make long conversations. I used to think: 'How can they do it? I always have such trouble and these people always seem to have something to say.'

I had to repeat the third year. To this were added some other points which came to bear on my decision to leave off studying. I had become tired of the situation which came up daily, trying to avoid questions and then having to answer in a certain manner, enduring jokes and being permanently confronted with my defect, having to live almost alone, shut off, as I had no courage to seek contact. I thought all this over and all that lay ahead of me and decided not to study any more. I felt this deeply, but I knew I was unable to fight it through. I had to do the opposite and seek something that suited me.

My life goes on. Events more or less like this still come up sometimes. But even so it is very difficult. I see myself bound, without freedom to act, although like everyone else I have ambitions and long to develop them, and even while wanting to do so I find it impossible.]

From this story, one can see to what e x t e n t an apparently insignificant speech defect can affect personal life.

The treatment given to this case followed physiodynamical laws in the sound production and coordination of articulation, phonation and respiration. Because of the intelligence, ability and effort of the patient, there was little difficulty in teaching him to produce the *l* sound. Much more prolonged and difficult was the problem of re-establishing words containing *l* in his vocabulary. These had to be 'conquered' gradually. He has now acquired a perfect vocabulary, the treatment and complete speech reintegration having taken, in all, three months. The case has recently reported that now, for the first time, he really feels that he is a member of the human society. He is trying to make up for the lost time by going to night school to prepare himself for his chosen career.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 256-259

A Public School Program for Hard of Hearing Children

Elvena Miller*

RESEARCH on specific techniques for discovering and rehabilitating the aurally handicapped is invaluable to those of us who are in public school work, for ours is the responsibility of using the scientific findings in our efforts to educate all of the aurally handicapped children of all the people. The school is the public agency that must discover and diagnose these children, refer them to private physicians for otological examination and treatment, and follow through until the hearing loss is corrected or arrested, when that is possible. The school must also provide a program for educating aurally handicapped children as normally and completely as other children can be educated.

The borderline hearing case in the public schools creates a special situation, not as a clinical problem, not as a problem for a segregated class, but rather as a handicapped child in the regular classroom who, with supplementary help, leads a reasonably normal life and makes normal school progress, eventually taking his place in adult society as a self-sufficient individual. To this end, it is the responsibility of the public schools to provide a complete hearing conservation program. In Seattle this is done through the close cooperation of four departments: medical, child guidance, general education and speech correction.

The first step of this program in Seattle is carried out by the school medical department which conducts a continuous program of testing the hearing of school children. A screening survey is made by the school nurses, and those children who give any indication of a hearing loss are given a diagnostic pure tone test on a Western Electric 6B audiometer. The head of the medical department then confers with the parents of the children so selected and, if there is need for such action, refers them to a private physician or otologist. The school nurse follows through, and all children showing a loss of around 20 decibels, or those whose loss is less but may be progressive, are given an audiometer test at least once a year—in many cases once every six months. Because of this program, many children have their hearing restored to normal.

The medical department passes on to the speech and hearing department the audiograms of all children with a loss of 20 decibels or more in the better ear. If a child has little speech, or faulty articulation, speech correction is given. If his loss is progressive or has become stabilized at 20 decibels, he is taught lip reading. Neither of these skills can be taught in isolation. Communication is a matter of education of the whole child mentally, physically, socially and emotionally. A remedial program is not enough. The public school must provide a complete program of education for the hard of hearing child.

For this reason children with borderline hearing pursue their education in the regular classroom with the supplementary assistance of a special

*Elvena Miller (M.A., Washington) is Supervisor of Speech, Seattle, Washington, Public Schools. This article has been adapted from a paper read at the 1947 convention of A.S.C.A.

teacher who comes to them two or three times a week as the need may be. It is no simple matter to determine which children can be left in their regular home schools and carry on with this special assistance, and which must be given their education in segregated classes. In Seattle we use as a criterion for placement, not so much the degree of hearing loss, as the ability of the child to use speech and language. If he has, or ever has had, enough hearing with or without the use of a hearing aid to develop reasonably understandable speech and language, we try to educate him as a hard of hearing child. This means that we have in our regular classrooms with normally hearing children some totally deaf children who were deafened after their speech skills were well established; similarly placed are others with congenital losses up to 50 decibels in the better ear. We find that the audiogram tells only part of the story. Of utmost importance are the emotional attitude of the child and the parents, the early education, the intelligence, and that vague something called the individual factor. The heads of the medical, psychological, and speech departments confer on each serious hearing case and determine the type of education and placement best suited to him.

The satisfactory adjustment of a deafened child, or one with borderline hearing, in the regular classroom does not come about by accident. The special teacher and the regular classroom teacher must understand each other's problems well and work together closely. Because of this, we find it almost a necessity that our special teachers specialize only after they have had training and successful experience in the regular classroom. They must know what it means for the classroom teacher to have in her large group an atypical child and be able to help her. They must know the problems and procedure of the classroom in order to help the child adjust from day to day. They must be able to use the regular classroom experiences and materials as the subject matter for their therapeutic programs. They must give not only speech correction and lip reading but must help the child build the vocabulary for which he has immediate need. They must be familiar with the curriculum and materials so as to give him tutorial help in his academic subjects. They must enlist the help of the classroom teacher in bringing about the child's psychological adjustment to his handicap. The special teacher and the classroom teacher must work together to enable the child to have the necessary successful experiences that will give him a feeling of social competence and make it possible for him to develop normally in a normal environment.

This psychological adjustment is often the most difficult one for the hard of hearing child to make, and without it the special education falls short. One of our greatest problems at the present time is an eight-year-old boy with a loss for the two ears and for different tones of between 49 and 61 decibels. He came to us this year from a segregated class and private teachers of speech and lip reading. Great credit is due these teachers for their success in giving him the skills of oral communication. His intelligence (I. Q., 123), his rich background of experience given him by his parents, and the medical prognosis—all point to the necessity of preparing him to live with normally hearing people. Because his parents have felt so sorry for him, because he has had so much individual attention, because all his class experiences have been with a very small group of children with a similar handicap, and because he has so much initiative that has brought him favorable recognition, he never has learned to conform. Our immediate and most pressing responsibility is to teach him to live with other children, to get at-

tention legitimately, and to assume responsibility for himself rather than depend on others. He is in an elementary school organized on a modified platoon system, which means that he has several class teachers. Here is a problem for a master teacher, one who is not only a specialist in clinical methods, but an experienced classroom teacher and psychologist, for she must encourage the classroom teachers to assume their share of the responsibility without feeling frustrated with their failures. Together they must educate the child and help him develop a normal personality.

Not always does the regular classroom teacher give the right sort of sympathetic attention to a hard of hearing child. This is a matter for the child to solve as he grows older, and for the special teacher. Since our goal is to prepare our hard of hearing children to live in the world as they find it, it is necessary for them to learn to overcome adverse circumstances. Of course, there is a limit beyond which we must not expect them to go. It is necessary to watch their classroom adjustments very carefully. Always the best development of the whole child must be considered, and the matter of class placement is of major importance.

It is essential, of course, that the hard of hearing child develop his skill in oral communication. Our children enter kindergarten when they are only five years old. When a little child presents an unusual speech problem, the speech teacher is called in, and in this way some hearing cases are discovered before the medical department can reach them in their screening program. Medical, psychological, and speech examinations are given and remedial measures are started at once. One little fellow with a 46-decibel loss in both ears came to kindergarten with practically no speech. The speech teacher, after breaking down his shyness, taught him to speak by using visual stimulation (mirror work was especially successful with him), vibration, motor kinaesthetic and auditory stimulation directed into his auditory canal. The mother supplemented the auditory training at home, and soon he was fitted with a hearing aid. The development of vocabulary built up a reading readiness. As he began to read, the special teacher worked right along with the classroom teacher, giving him speech, lip reading, phonics, and oral reading all at the same time. The boy is now making normal progress in the third grade and is accepted by his classmates. He does not feel himself to be an exceptional child.

Another boy with a loss of 71 and 44 decibels, respectively, in the two ears, had such poor speech and so serious a language deficiency when he entered school at seven years of age, that he was started in a class with deaf children. This proved to be the wrong placement for him, for he did not respond to the type of analytical speech work with elements given the deaf children. What he needed was speech correction. He was provided with a hearing aid and transferred to a regular classroom taught by a teacher who is a specialist in remedial reading, and is doing well with supplementary tutoring, speech correction, and lip reading.

The speech of our deafened children, of course, presents its characteristic problem. For such youngsters we must have a speech conservation program, stressing care in articulation, voice quality, and melody. The usual formal methods we find valuable, but even more so is the psychological effect of keeping the child confident, happy and spontaneous. Normal speech results in the controlled situation, and while the carry-over to outside situations is slow, it is encouraging.

Skill in lip reading is closely related to skill in speech and language. Our lip reading techniques are the

more or less standard ones used in most clinics. Our work is both analytical and synthetic. We undertake to develop speed of eye movement and speed of perception. We find that the hard of hearing child often tries to rely on his imperfect hearing, so we make quite a point of using a tantalizing but insufficient amount of voice. The materials used for lip reading must be closely correlated with those used in classroom work.

Thus far I have discussed the program for the elementary school child who is a borderline hearing case. Occasionally a pupil will adapt himself so well with this kind of special help through the sixth grade that he is able to carry on successfully in junior and senior high school with no further assistance. If he needs further help he may attend a junior or a senior high school center where he receives lip reading, speech correction, and any tutorial help necessary. All other classes he takes with regular pupils. Since adolescence is fraught with emotional problems, the special teachers in the speech and hearing centers have to do a great deal of guidance and personality building. To this end the junior high school hard of hearing child is placed in a home room with a teacher of general speech where he is able to discuss his problems objectively and develop confidence and poise through general speech activities.

Auditory training is essential to any educational program for the acoustically handicapped. Group hearing aids are impractical except in segregated classes. In a public school system, recommending an individual hearing aid is not a simple matter. Often physicians are unwilling to have their younger patients wear them; parents may object because they do not want others to know of their child's handicap; the expense presents an obstacle; uninformed people think that hearing aids give complete correction and no lip reading is necessary; young children have trouble taking care of them in school; older children may have a complete psychological blocking concerning them. If the audiometric curve indicates that a hearing aid will be of value, we consult the private physician and make our recommendation. A portable radio type of instrument is used experimentally with young children to interest both them and their parents. The individual hearing aid is usually worn by the very young child at home first and the mother is given instruction in auditory training. Selecting the proper hearing aid is a responsibility that the schools cannot assume. Fortunately the University of Washington is preparing to offer hearing aid consultation service under the direction of Dr. James Carrell and Dr. E. Thayer Curry.

A complete program of hearing conservation for the entire state of Washington is underway, sponsored by the State Department of Health and directed by Dr. Emily Pratt, who has the cooperation of the State Superintendent of Public Instruction, Mrs. Pearl Wanamaker. Their program, like that of Seattle, is designed to include (1) screening the hearing of school children, (2) diagnostic testing with a pure tone audiometer, (3) otological examination and medical follow-up, (4) suitable education including lip reading and speech, and (5) vocational education and placement. This is an ambitious but necessary program and one that can be realized if those of us who know the need assume the responsibility of educating both the general educators and the public at large.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 260-263

The American Hearing Society

Helen Scriver*

FOUNDED IN 1919 by the late Dr. Wendell C. Phillips, with headquarters in Washington, D. C., the American Hearing Society is a national organization in the field of hearing. Its activities center around three main objectives: (1) prevention of deafness; (2) conservation of hearing; and (3) rehabilitation of the hard of hearing.

Types of Regional and Local Organizations.

With a paid staff in Washington, D. C., the Society functions through 122 chapters, 40 of which receive support from local Community Chests and, for the most part, have trained executive directors. Eighty-four of the chapters maintain meeting rooms equipped with group hearing aids. Local chapters vary in size and type of program but generally provide some or all of the following activities: lip reading instruction, speech correction and voice training, auditory training, hearing aid services, instruction for parents of hard of hearing children and for the hard of hearing preschool child, lectures and entertainment, counseling and guidance. Both the local chapters and the national headquarters provide specialized information services concerning available otologists, teachers of lip reading, approved hearing aids, facilities offering hearing aid consultation and other factors in hearing loss adjustment.

Two field workers from the national organization, upon invitation of local agencies, make surveys and provide leadership to chapters in setting up, under trained workers, a standard program of rehabilitation.

Elements in Organizing Support for a Remedial Program.

With one out of ten persons having impaired hearing and three million children in the United States with a hearing loss, the program of the American Hearing Society fills a real community need and offers services not only to the hard of hearing but to school authorities, teachers, physicians, nurses, social workers and to the general public.

In 1946 the budget of the American Hearing Society was reviewed and approved by the National Budget Committee, consisting of 27 outstanding laymen and professionals, and a budget of $125,700 was recommended to local Community Chests for consideration in connection with their 1947 campaigns. This recommendation has met with an encouraging response from 30 Community Chests. Twenty-one of these cities made direct payments to the Society, while nine cities added the Society's quotas to the local budget of its chapters which, in turn, paid the Society. The most encouraging factor is that direct appropriations have been received from 11 cities in which the Society does not have a local chapter or activity of any kind.

Relations with Educational, Governmental, and Religious and Charitable Organizations.

The American Hearing Society is a member of the National Health Council and the National Social Welfare Assembly and is working with these organizations to bring about an effective program of cooperative planning and service. It enjoys close coopera-

*Miss Helen Scriver is Editor of *Hearing News*, the official publication of the American Hearing Society. This paper was presented at the 1947 convention of A.S.C.A.

tion with the War and Navy Departments, the Veterans Administration, the U. S. Bureau of Education, Children's Bureau, U. S. Employment Service, Federal and State Vocational Rehabilitation Services, National Rehabilitation Association, National Society for Crippled Children and Adults, and the Volta Bureau. It recommends only those hearing aids which have been accepted by the Council on Physical Medicine of the American Medical Association. Over a period of 28 years, the American Hearing Society has been indebted for leadership, in the office of its president, to eight otologists, one physicist, one speech and hearing specialist, one lawyer and one very able hard of hearing woman.

Sources of Revenue and Breakdown of Expenditures

The organization derives its income from three regular sources: (1) membership dues from individuals and chapters; (2) sales of publications which include a textbook on lip reading, reprints of important articles which have been published in its magazine, *Hearing News*, and posters designed for National Hearing Week; and (3) contributions from individuals and Community Chests.

At the present time approximately 40% of the operating income goes for office headquarters and staff; 40% for field service; 10% for *Hearing News*, and the remaining 10% for public relations.

Professional Standards Required

Membership in the American Hearing Society is open to anyone interested in its program. It is not strictly a professional society, but its membership includes a large number of otologists, social workers, school administrators, teachers, health and rehabilitation officers, and speech and hearing therapists, as well as thousands of hard of hearing individuals, their parents and their friends. Included in membership is the official publication, *Hearing News*, a 24-page bulletin issued monthly and divided almost equally between informative papers and advertising. The advertising evaluated by the Society's Technical Committees represents schools and teachers of lip reading, approved hearing aids, batteries, tubes, and products such as clocks and radios with special attachments for the hard of hearing.

The field workers of the American Hearing Society are experienced social workers, and many of the executive directors in the local chapters have had this training. Others have added experience on the job to a background of training and experience as teachers of lip reading to hard of hearing adults.

In May of the past year, a two-day Executive Directors' Conference was held in Chicago, to which 32 chapters sent professional workers. At this Conference it was recommended that the American Hearing Society should: (1) provide more adequate training facilities for executive directors with a closer relation to social work; (2) arrange for supplementary courses for workers and for internships in chapters; (3) promote training in more universities for executive directors; and (4) offer scholarships for prospective executive directors.

In this connection it should be noted that the Cleveland Hearing and Speech Center, affiliated with Western Reserve University and a chapter of the American Hearing Society, is offering courses providing training for executive directors in hearing societies.

The Teachers' Committee of the American Hearing Society has set up qualifications for teachers of lip reading to adults, and, at the request of the War Department and the Veterans Administration, has recommended many teachers trained in this special subject. In the proposed standards

which have been submitted for consideration to a committee of the American Speech and Hearing Association, we earnestly recommend that the experience requirement of a teacher of lip reading to veterans shall be not less than 6 units, or 90 hours) of actual lip reading teaching, 2 units (or 30 hours) of which shall have been with groups of adults. We should like to emphasize the fact that a lip reading teacher must be a well-adjusted individual, have a genuine interest in the hard of hearing, have a pleasing personality, legible lips, a good speech pattern and no unpleasant mannerisms. We believe that hard of hearing lip reading teachers have much to contribute to rehabilitation by reason of their own personal understanding of a hearing loss and their experience in the field of adult education.

Brief Report of Results Accomplished

Some years ago the Society collaborated with the U. S. Bureau of Standards in examining and reporting on hearing aids. In connection with the rehabilitation program for adults, largely adminstered through the Society's chapters, the installation of group hearing equipment in public meeting places such as theatres, lecture halls, auditoriums and churches, has been encouraged and promoted. The Society owns its own special equipment with 120 outlets, and this is always installed for zone and national conferences.

In addition to its program for adults, the American Hearing Society has been outstanding in its work for children. In 1924 the Society organized the first National Committee on Hard of Hearing Children, and cooperated with the Bell Telephone Laboratories in the development of the phonograph audiometer.

Starting with a pamphlet, 'The Hard of Hearing Child,' prepared for the U. S. Bureau of Education, followed by the first film on the problems of the hard of hearing child, the Society has taken a leading part in securing state and national legislation for physically handicapped children. A 'Digest of State Laws Affecting the Acoustically Handicapped,' published by the U. S. Government in 1943, was the direct outcome of pressure brought by the Legislative Committee of the American Hearing Society.

A tribute to our part in the development of hearing conservation programs was recently given by a state hearing conservation specialist in these words:

> The American Hearing Society, with its affiliated chapters, has contributed more toward the development of hearing conservation programs than any single agency. Its philosophies are embodied in every hearing program in the world, and its guidance and counsel are being sought constantly by all who are interested in the problems of the acoustically handicapped, both child and adult.

In demand by state, county and local educators are the two pamphlets, well illustrated with photographs of school situations, 'Conservation of Hearing—Its Commencement and Its Ending,' by Emily A. Pratt, M.D., and 'Instructions for Conducting Audiometer Tests,' by Warren H. Gardner, Ph.D. State conservation of hearing programs, as a result, either direct or indirect, of the encouragement furnished by the American Hearing Society, are operating in more than twenty states. Through early testing, otological examination and treatment, many thousands of children have been saved from a life made unhappy by a hearing loss, while for those children who must face a handicapping loss of hearing the American Hearing Society recommends lip reading instruction, and hearing aids when feasible.

In 1927 the American Hearing Society established National Hearing Week which has been observed regularly each year, with endorsement of

the event by many city and state officials and by the President of the United States.

Every year the organization answers thousands of letters of inquiry from all parts of the world. This past year, as a result of favorable publicity in a number of popular magazines, the number of requests for information was increased by 2,500. Questions concerned hearing aids, lip reading, auditory training, and fenestration operation, diet, treatment and other subjects connected with a hearing loss. Our list of publications covers these subjects and also includes articles on hard of hearing children, hearing clinics, hearing societies, hearing tests, military service, parents, psychology, speech, vocational advice and employment, and young people. (One leaflet entitled 'Sharing Responsibility When Deafness Comes,' prepared by Betty C. Wright originally for the veteran, is applicable to all hard of hearing persons, their families and their friends.)

Objectives and Recommendations for the Future

For the future, the American Hearing Society proposes to continue its present program of activities and to expand its work in behalf of children. By sponsoring courses for training executive directors the Society can expect improvement in the administration of its program.

It is the hope of the American Hearing Society to establish a research fund which will provide grants for the purpose of studying the causes of deafness, new methods of effecting cures for hearing losses, and the psychological and social aspects of acquired deafness. The establishment of a department of statistical research is also contemplated. It is quite true that objectives and definite recommendations for the future exceed the present means for putting them into effect, but only with such vision can the American Hearing Society continue to make its contribution in the field of hearing.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 264-267

Organizing a Speech Clinic in a Small College

Herold Lillywhite*

IT IS THE PURPOSE of this article to present some of the problems involved in organizing a speech clinic in a small college. In this discussion the term 'speech clinic' refers only to the phases of speech connected with speech correction. The limitations of the term 'small college' are, of course, difficult to define. Whittier College, upon which this discussion is based, has an enrollment of 1,135 and is probably fairly representative of small colleges throughout the country.

The Function of the Small College Clinic

The function of the small college clinic seems to be quite different from that of the university or the private clinic. The small college can probably expect to be most effective in these two areas: (1) the correction of defective speech among the students enrolled in the college and children and adults in the community served by the college, and (2) the training of public school speech correctionists.

The larger institutions can perform these same functions, but they can also carry on other vital functions, such as research and graduate work in speech pathology. The small colleges certainly should approach many problems from the experimental point of view and should be alert for research opportunities, but they have neither the equipment nor the personnel to carry on extensive research and graduate programs.

In order to perform its two important functions, the small college speech clinic must be soundly organized. Our experience suggests that the problems involved in organizing such an activity as this in a small college are specialized and peculiar to this area of speech education. For this reason a discussion based upon this experience may be of value to others in similar situations.

Physical Equipment and Facilities

Physical equipment and facilities should be one of the first considerations of the speech clinic. Few small colleges can hope to begin with elaborate or complete facilities. Probably the minimum essentials can be listed as: two or three small rooms, readily accessible for clinic use, more classrooms available for overflow at certain times, a recording machine and a separate playback, an audiometer or access to audiometric testing by a competent technician, mirrors, and a reasonable assortment of books, games, toys, and testing materials. The clinic should be located on the ground floor with easy access to outdoors, work rooms, play rooms, rest rooms, and away from other school offices and classrooms.

At Whittier we began last summer on the third floor, in one room separated into an office and three cubicles by several six-foot plywood partitions. We had access to a few other classrooms after four in the afternoon.

*Herold Lillywhite (Ph.D., N.Y.U.) is Director of the Speech Clinic, Whittier College, Whittier, California. This article is from a paper presented at the 1947 convention of the Speech Association of America in joint session sponsored by the A.S.H.A.

Only the sunny Southern California climate made it possible for us to get through the summer. But the canny Quakers have seen virtue in our efforts, and we now have a newly constructed, well-equipped clinic laboratory, on the ground floor, away from other classrooms and offices, and with an outside entrance. It is significant that these facilities were made available after the clinic demonstrated its value, not before it was organized.

Personnel

Another problem as important as physical equipment is that of personnel. If we wait for the ideal situation we will never begin. Staff will seldom be adequate, but we must start with what we have. Our experience leads to the warning that the speech clinic should not be considered as a spare time activity, yet most clinics in small colleges will probably of necessity have to be organized on such a basis. Adequate personnel usually will not be authorized until the need is demonstrated.

Since we had no trained clinicians or staff, we hired a few public school correctionists who brought others to work for the experience. With the additional help of the chairman of the psychology department and student clinicians, we began. The results were surprisingly good. Now we have five part-time clinic staff members, a number of graduate students in speech correction, and a substantial group of student-clinicians.

Gaining the Support of the Administration and Colleagues

Gaining the support of the administration and other teachers offers another serious problem. It is certain that the administration and faculty of most colleges will be relatively uninformed as to what speech correction is, what its needs are, and what it can accomplish. It will probably be easier to raise a million dollar endowment for the clinic than to attempt to explain what it is. For this reason it may be found more advantageous to organize the clinic quietly, letting others consider it 'just another speech class' for the time being. In other words, you can come in quietly by the back door and go to work. Then some day you can say, 'Look folks, we've been here for some time.'

There is enough of the dramatic in the speech correction program that it inevitably becomes an excellent public relations agency for the college. Support will not be long in coming after the publicity value is established.

Contacting Those Needing Treatment

After physical equipment, personnel, and support for the clinic have been gained there is the problem of contacting those needing treatment. The on-campus problem is not great. We can rely on other teachers, campus publications, word of mouth, and the more certain method of conducting a speech survey of all entering freshmen.

Reaching the off-campus groups is more difficult. Certainly an attempt should be made to reach the public schools. Perhaps the most direct approach to the schools is through the P.T.A. It isn't difficult to get an invitation to speak at a P.T.A. meeting. Here is an opportunity to explain the problems of correction and the nature of the services that a speech clinic can offer. The same kind of approach can be made to the service clubs, A.A.U.W. groups, churches, hospitals, health centers, welfare agencies, and other civic groups. Our experience has indicated that this kind of public relations is far more effective than others that we have used. This approach may seem like a personal publicity campaign, but it is entirely justified. The public is so uninformed concerning speech defects, the possibilities for correction, and the

facilities available that it is difficult to perform a more worthwhile public service than this kind of a speaking campaign.

If the college has an alert public relations man he should do the rest. Perhaps it may be just as well if he is not as alert as the one at Whittier, who sent announcements of the opening of our clinic to almost every paper in southern California and to most of the radio stations. The majority of the papers published the story, several local radio stations put it on newscasts, and the Richfield *Reporter* broadcast it on a Sunday evening newscast. Within a few days the Los Angeles *Times* had sent a photographer over for pictures—and so we were in the news. Needless to say we got public response. It takes little imagination to conceive of the warmth with which the college administration began to regard the speech clinic. We were in! But in spite of this wide publicity, the majority of our clinic cases are now coming to us as a result of our speaking engagements before civic groups.

Financing the Clinic

Assuming that all has gone well up to this point and we have a good number of cases coming to be examined, diagnosed, and treated, we still have the important matter of how to finance the clinic. Seldom will financial support from the college be adequate in the beginning, if it ever is. For that reason a fee for treatment is necessary.

We began by charging a clinic fee for treatment according to the type and severity of the case. The fee ranged from fifty dollars for a summer session of six weeks down to thirty dollars as a minimum. During the full semester our fee system is slightly different. We charge twenty-five dollars a semester for one session per week and twenty dollars additional for each additional session per week. Persons who are unable to pay are given treatment free of charge.

We have recently received assistance from local service clubs in the form of payment of fees for children unable to pay and for the purchase of equipment. The college contributes some toward equipment and salaries, but so far our major source of income is from fees. This method of financing is not adequate, but finances do not constitute a major problem.

Student-Clinicians

The use of student-clinicians is the final problem we shall consider at this time. When is a student qualified to begin doing effective work in the clinic? Many schools have set unreasonable course requirements for students before any practical experience is given. Others have given entirely too much responsibility to untrained students. Our practice at Whittier is not the final answer, but it is serviceable because it is built upon the needs of the situation. Our students begin to assume minor clinical responsibilities after one semester of clinical experience as observers and assistants and one course in speech correction principles and methods. In another semester they are allowed to take over more direct responsibility for minor cases. It has been found that the experienced elementary teachers, who return in summers to do work in speech correction, can very quickly become effective in the clinic with relatively little actual clinical experience. Regularly enrolled younger students need more time before they can be expected to do effective work in the clinic.

Conclusion

There are many other problems that will be met in establishing a speech clinic in the small college.

They are real and serious but not insurmountable. If the need exists, an effort should be made to meet it. Many of us make the mistake of avoiding this responsibility because of lack of physical equipment, understanding on the part of others, trained personnel, and financial support. These aspects must be developed slowly, but the clinic will need to be in operation in order to develop them.

Our experience at Whittier suggests that one person, with training, insight, an abundance of patience and stamina, a room in which to work, and an honest appreciation of the need for such a service, can organize a speech clinic in a small college. Its growth will probably insure the fulfillment of its needs and functions.

Students and Graduates in Speech Correction in the United States

(Prepared for the American Speech and Hearing Association by Martin F. Palmer, Sc.D., Chairman, Committee on Educaton.)

Twenty-two training institutions whose graduates have obtained Professional membership in the Association were queried; first, as to the number of students who were taking training at these institutions, and, second, as to the number of students expected to graduate in June, 1948, at the Clinical or Professional membership level, so far as academic requirements only were concerned.

Fourteen of the 22 training institutions responded. There were 439 students at these institutions, enrollments varying between 10 and 114 students. Had all queried institutions replied, there would have been an approximate total, then, of 690 students. Ninety students were expected to graduate in June with the academic part of the Clinical membership program completed, and 14 were expected to graduate with the academic part of the Professional membership program completed. Extending this figure by those who did not reply would show that approximately 140 graduates came into the field in June with the academic requirements for Clinical membership, and 22 came into the field with the academic requirements for Professional membership.

Since only those persons who meet Professional requirements are entitled to do corrective work, except under Professional supervision, and the demands for trained personnel are so great, these 22 no doubt found full professional opportunities in any part of the country they preferred.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 268-272

Anticipatory Speech Responses in Children with Articulatory Defects

Mary Ellen Hull*

IN THE SPEECH examination of children with articulatory defects an unusual reaction may be observed. When asked to repeat nonsense syllables after the examiner, an occasional child will repeat the sound without a delay between the stimulus sound and the response. For purposes of this study, the reaction has been called 'anticipatory speech response.' No reference to this particular phenomenon has been found in any of the related literature.

The purpose of the following study was (1) to describe the nature of the response, (2) to present an inclusive study of the various reactions of a child who makes anticipatory speech responses, (3) to study these responses in relation to the responses made by children with normal speech when repeating given speech sounds, and (4) to present a case study of a child with a severe articulatory defect who made anticipatory speech responses and whose speech was ultimately corrected.

The Sources of Data, the Subjects and Groups Studied

One of the most important sources of data for this research was the extensive case history which was taken for each child preceding the examination of his speech defect. Other information was found in the complete record for each lesson which was kept by the instructor throughout the period of retraining. Additional material was obtained from personal conversations with the parent and classroom teacher.

Two groups of children were studied. The 'normal' group was composed of 14 public school children between the ages of six and twelve who had no speech defects. The other was a group of 32 public school children, varying in age from five to twelve years, who had articulatory defects.

In addition to the groups, two individual cases were studied in more detail. The first case was a seven-year-old boy from the first grade who had a severe articulatory defect. On examination it was discovered that he made anticipatory speech responses. This case was studied to determine the nature of one child who made this response. His behavior, intelligence, and his responses to a battery of seven tests involving motor reactions were studied.

The second individual case, a girl, was five years old when examined and was found to have a rather severe articulatory defect. The examiner made the note that she repeated her sounds at the same time he said them. This child was dismissed from the clinic as corrected at the end of a five months training period. During the course of this study, this case underwent a speech retraining program especially designed to eliminate both articulatory defects and anticipatory speech responses.

*Mary Ellen Hull (M.A., Univ. Wichita) is a clinical instructor in speech correction at the Institute of Logopedics, University of Wichita, Kansas.

TABLE I. The subjects, age, and number of anticipatory responses given by 'normal' group.

Subject	Age	AR*
	Part II	
A	6	2
B	8	9
C	10	9
	Part V	
Subject	Age	AR*
A	6	9
C	10	9
D	7	5

*Number of anticipatory speech responses given.

TEST, TECHNIQUE AND RESULTS OF THE GROUPS STUDIED

In studying the groups with normal speech and articulatory defects, a test with five parts was devised. Administration of the test consisted of having the child repeat the following groups of stimuli after the examiner without watching the examiner:

Part I. Eleven isolated vowel sounds.

Part II. Nineteen nonsense syllables.

Part III. Thirty unrelated words.

Part IV. Ten simple sentences.

Part V. Nineteen nonsense syllables.

Each child was tested individually. Before beginning each part of the test, the child was instructed to repeat each sound stimulus after the examiner. The sound stimuli were given at intervals of one second. At the conclusion of each part of the test the examiner recorded the occurrence, if present, of anticipatory responses, the number of responses in which this type of reaction was made, the accuracy of each response, and the age of each child.

In repeating each of eleven vowels (Part I), each of thirty words (Part III) and each of ten sentences (Part IV), none of the 'normals' gave anticipatory responses. In Part II, in which the child was asked to repeat each of nineteen nonsense syllables without watching the examiner, three subjects (A, B, and C), gave anticipatory responses. Three subjects (A, C, and D) responded in an anticipatory manner on Part V of the test in which the children were asked to repeat each of nineteen nonsense syllables without watching the examiner.

As in the 'normal' group, none of the children in the defective group gave the anticipatory response in Parts I, III, and IV of the test. In Parts II and V, four of these subjects (P, Q, R, and S) made anticipatory responses. Although in this group, those who made anticipatory responses produced the consonants incorrectly, the production of each syllable was altered to a much greater extent when repeated in the anticipatory manner than later, when the examiner specifically asked the child to wait before repeating the syllable.

The foregoing study of the two groups revealed that the anticipatory speech response is not a phenomenon limited to children with defective speech. The responses occurred in children of varying ages in both groups. The responses appeared similar to echolalic responses in that the sounds appeared to be repeated without any particular effort on the part of the subject to actually compre-

TABLE II. The subjects, age, and number of anticipatory responses given by the group of articulatory defectives.

Subject	Age	AR*
	Part II	
P	6	9
Q	6	9
R	9	9
S	13	11
	Part V	
Subject	Age	AR*
P	6	9
Q	6	9
R	9	9
S	13	11

*Number of anticipatory speech responses given.

hend the sound. However, it seemed to differ from echolalia in that the child was able to inhibit the response when specifically asked to do so. One factor seemed consistent in both groups: more of the children tested repeated the last nine syllables of the nineteen test sounds in an anticipatory manner than any other part of the series. Children with articulatory defects frequently have a faulty production of those same nine consonant sounds which are the last ones to be learned in the development of normal speech. (**4**).

Tests, Techniques and Results of The Study of Two Individual Subjects

In order to gain a more complete understanding of anticipatory speech responses, detailed studies of children who made such responses seemed essential.

The first subject chosen for intensive study was given a battery of seven tests. The purpose was to discover any deviation from 'normal' responses in these tests and also to determine whether there existed a relationship between anticipatory speech responses and the child's reactions to the tests.

Test I was designed to ascertain the child's ability to learn and apply certain rhythm and accent patterns. His ability to walk to a strongly accented piece of music was also investigated. The child was first allowed to watch the examiner execute each pattern himself five times. On the first part of the test, the child reacted immediately and tried to perform the rhythmical movement while being instructed by the examiner. This was the only part of the rhythm tests in which the child anticipated the response.

Test II was Palmer's (**5**) modification of the 'series type' (**8**, 405) auditory memory span examination. In this test the examiner spoke three groups of three nonsense syllables at about one per second. On each group the child performed correctly.

Test III was Palmer's (**5**) modification of the 'delayed response' (**7**, 142) auditory memory span examination. A delay period of ten seconds was used, after which time the child repeated the sound without error.

Test IV was an adaption of the perseveration tests described by Eisenson (**2**). The child was first asked to make a series of horizontal lines, then vertical lines, each for a period of five seconds. The child was then asked to begin marking a line of one sort and when he heard the command 'change' he was to make the other. It was found that the child did tend to perseverate slightly, though not beyond what could be considered normal limits. The child did not anticipate the command to change.

Test V was an examination of the knee jerk, biceps and Achilles tendon reflexes and the rebound phenomenon. The reflexes appeared normal. The child's reaction to the knee jerk reflex was unusual. Each leg responded normally when the reflex was tapped. When the examiner started to retest the left leg, the child voluntarily extended his right leg. This was considered to be an anticipatory response in which the subject erred.

Test VI was a series of five tests for coordination described by Grinker (**3**, 124). Three additional tests from Travis (**6**, 223-226) were used to determine the subject's ability to control his tongue, lips, jaw, and diaphragm. Although some of the child's movements were not well coordinated, it appeared that he was within normal limits, and no tendency to anticipate any part of this test was shown.

Test VII was used to discover whether the child possessed any lip reading ability. The child was asked

to repeat aloud fourteen nonsense syllables silently whispered by the examiner at a distance of six feet. He was then tested in the same manner with fourteen words. The child repeated one-half of the nonsense syllables correctly, but the words were all repeated incorrectly.

Even though the child appeared to be within normal limits on all seven tests, it was found that he did show a slight tendency to anticipate motor reactions.

In conversations with the parent and classroom teacher of this child he was reported to be fairly easy to manage but possibly somewhat nervous and distractible. There was some variance between his behavior at home and at school which could be due to the change in the situation and perhaps a difference in handling. The school record revealed that this child was a little below the average in intelligence. A tendency toward haste and incorrect results was evidenced in most of his reactions at school.

The second individual subject was studied in regard to a possible speech retraining program for a child who has a severe articulatory defect and who makes anticipatory speech responses. The history of this child showed normal development in every phase with the exception of the speech process. The diagnosis of her speech defect revealed that she either omitted or produced incorrectly eleven consonant sounds.

The retraining program of this child moved along at a satisfactory pace and the child was dismissed as corrected at the end of a five-month training period. Anticipatory responses were not elicited every time the child was asked to say a sound. The responses seemed to show up to the greatest extent after the child had learned to produce a sound correctly and then was asked to repeat from a list of words which were spoken first by the instructor.

Inhibition of anticipatory speech responses was achieved with this child when she was asked to wait until she heard a rap on the table before repeating the word. As the retraining program progessed, the tendency toward making anticipatory speech responses gradually diminished. This may have been partly due to the technique designed to eliminate the rapid response. However, if the anticipatory reaction is a wedge in the normal development of speech, as the child gained in speech maturity, the wedge would tend to disappear.

Findings and Conclusions

The conclusions drawn from this investigation were necessarily limited, because an insufficient number of cases were available for study. The following findings and problems for future study were thought to be of some importance.

First, it was found that in children with articulatory defects the production of each syllable was altered to a much greater extent when repeated in the anticipatory manner than when there was a delay between the stimulus sound and the speech response.

Second, it was also found that the anticipatory speech response is not limited to children with articulatory defects. The study with the groups indicated that children with normal speech gave these responses, and reports from the instructors in the clinic showed that these responses are also present in children with aphasia.

Third, it was found in the detailed study of one child who made these responses that the child tended to be 'nervous' and distractible. He was also found to be below the average in intelligence.

Fourth, it was found that a child with an articulatory defect could be taught to inhibit anticipatory reactions, and in so doing the sound could be more efficiently learned.

From the findings of this study it was concluded that when a child makes anticipatory speech responses the sounds are less accurate than when there is a delay. It was also thought that when these responses are made the child is hindered in learning speech sounds correctly; therefore, anticipatory speech responses were thought to be a contributing factor to the cause of some articulatory defects.

References

1. Bunger, Ann M. *Speech reading: Jena method.* Danville, Illinois: Interstate, 1944.
2. Eisenson, Jon. A study of the perseverating tendency in stutterers. *Quart. J. Speech,* 1936, **22**, 626-631.
3. Grinker, Roy R. *Neurology.* Springfield, Illinois: Thomas, 1945.
4. Muyskens, John H. Unpublished material given by Professor Muyskens of the University of Michigan to Martin F. Palmer and used at the Institute of Logopedics.
5. Palmer, Martin F. Unpublished material used in the clinic of the Institute of Logopedics, Municipal University of Wichita, Wichita, Kansas.
6. Travis, Lee Edward. *Speech pathology.* New York: Appleton, 1931.
7. Van Riper, Charles. *Speech correction: Principles and methods.* New York: Prentice-Hall, 1939.
8. West, Robert, Kennedy, Lou and Carr, Anna. *The rehabilitation of speech.* New York: Harper, 1937.

CAN YOU GIVE A COMPLIMENT?

We have already indicated that the attitude of acceptance and friendliness that pervades the group is an irradiation from the group therapist. This is particularly evidenced by the praise that becomes a rule of group life. The group therapist makes a point of praising every deserving creative effort (but not social acts) and calling the group's attention to it. Very soon, the members quite spontaneously begin to notice one another's work and praise it warmly. We consider this development important, for to be able to praise is not only an indication of social development, but of self-acceptance as well. The unconscious reaction to giving praise is the feeling that the praised person is placed above the one who praises. To praise others fullheartedly, therefore, implies self-confidence.

From *An Introduction to Group Therapy* by S. R. Slavson (New York: Commonwealth, 1943) Pp. 170-171.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 273-282

News and Announcements

Miriam D. Pauls*

Letters were written to all foreign subscribers of the *Journal* requesting information about their programs. A number of appreciative and interesting replies have been received to date:

Dr. Jean Tarneaud, Paris, formerly one of the editors of the *Journal*, wrote a very gracious note requesting that his felicitations be extended to the group. He enclosed a mimeographed report of the meeting of the *Societe Francaise de Phoniatrie* which was held October, 1947, at the College of Medicin, Paris. Professor Terracol is president of this society, and some eighty members are listed in the report. Dr. Tarneaud also enclosed three reprints of his more recent writings on vocal pathology and announcements of three new books which he has written.

Señor M. Rios Arias, Santiago, Chile, has kindly referred our request for information to the Director of the School of Blind and Deaf and Dumb which is under the Ministry of Education and is the only organization that takes care of such problems in Chile. Señor Arias' interest in speech problems, and hence his subscription to the *Journal*, was fostered by the fact that a member of his family had become aphasic.

Joan H. Van Thal, F.C.S.T., London, wrote the following interesting information:

> May I first of all explain that the setup of our profession in Great Britain is different from that in the U. S. A. There are no university programs such as you indicate. The training of a speech therapist is not academic, but a specialist professional one.
>
> The College of Speech Therapists is the qualifying body, of which I am at present vice-chairman. This body recognizes training schools which have to give theoretical and practical instruction on the prescribed syllabus of the College in preparation for the examination for Licentiateship. There are at present four such training schools in London and two in Scotland, all linked with hospitals. Students have clinical practice both in these hospitals and in school clinics. An article on the subject is due to appear in the September number of our journal, *Speech*.
>
> The field of 'hearing' is held to be the province of the teacher of the deaf. There is, however, a Department for the Deaf at Manchester University, which is unique. The Department of Phonetics at London University is the only one on a large scale in this country—concerns itself but very little with abnormal speech.
>
> For some time, I have been engaged in Research on Dysfunction of the Upper Respiratory Tract in collaboration with the Rhinologist, Edward Gwynne Evans, M.R.C.S., under the auspices of F. C. W. Capps, F.R.C.S. Our first report was read before the Royal Society of Medicine in 1945, and was published in Volume XXXVII, No. 3, of the proceedings of that society. A further paper was read by Mr. Gwynne Evans and C. F. Ballard, M.R.-C.S., L.D.S. (England), published in the *Dental Record* this year.
>
> After our Conference in September, at which we look forward to seeing members of your organization, you will have a lot of material at your disposal.
>
> The Fellowship of the College of Speech Therapists can be obtained on submission of an acceptable thesis, which must be of a standard equivalent to that required for a university degree in other fields. It may also be bestowed for distinguished service. Five years must elapse after being admitted as a Licentiate before a Fellowship thesis may be submitted. An even longer period must elapse in the rare cases of a Fellowship being given for distinguished service to the profession. (We have a purely Honorary Fellowship for members of allied professions whom we wish to honor.)
>
> Admission to the College can only be obtained by examination.
>
> If you have never seen a report of our 1945 conference, you can obtain one by applying to the Secretary, College of Speech Therapists, 68 Queens Gardens,

*Miriam D. Pauls (M.A., Wayne) is at the School of Speech, Northwestern University, Evanston, Illinois.

London, W. 2. The price is five shillings, but I think a copy would be supplied in exchange for some American literature.

I do not know if the following is known in the U. S. A.: The Education Act, 1944, in its clauses providing for special educational treatment for handicapped children, made it a statutory obligation for education authorities to provide speech therapy for children handicapped by defects of speech. Prior to 1944 they were permitted to do so, and many did, but now they are obliged to. This act, of course, provided for special schools for those suffering from hearing disabilities and other handicaps (visual defects, mental defects, emotional disturbances, and delicate children).

B. S. Page, University Librarian and Keeper of the Brotherton Collection, Brotherton Library, University of Leeds, replies as follows:

. . . speech training is given in this University in the Department of Education. Moreover, the English Department has a lecturer in phonetics who is concerned in the main with the teaching of this subject, that is, primarily theoretical phonetics.

Professor Urpo T. Siirala, Head of the Oto-laryngological Clinic of the University of Turku, Finland, reports that a new speech correction department has recently been established. Their greatest difficulty is the lack of competent physicians and teachers. He requests information on the possibilities of special education for one or two young physicians or teachers in this country.

During July and August, at Kedron Valley Inn, South Woodstock, the Vermont Association for the Crippled held its second annual camp for children with disorders of speech and hearing. Thirty-five Vermont children ranging from 6 to 16 years of age were enrolled for speech and auricular training. They participated in an intensive training program, with group and individual classes, five to six hours daily for eight weeks.

Miss Harriet M. Dunn, Director of the Speech and Hearing Services of the Vermont Association for the Crippled, was in charge of the camp. Other speech therapists were Miss Patricia M. Beatty, Speech and Hearing Counselor of the Vermont Association for the Crippled; Miss Margaret Kohr, Speech Therapist in the Wheeling, West Virginia, Public Schools and for the West Virginia Association for the Crippled; Miss Mary Gardner and Miss Jean Harris, who have been student teachers in speech correction during the past year at the Speech Clinic, University of Michigan.

The recreation program was supervised and conducted by Miss Virginia Moore, who recently received her B.S. in Health and Physical Education at Ithaca College, Ithaca, New York, and her assistant, Miss Jo Ann Burt, an undergraduate at the same school.

During the summer, mothers of some of the children served as house mothers for a period of one or more weeks. In addition to their regular duties they attended classes to observe the children at work and had regular conferences with the director in order that later they may carry on at home, under guidance, some of the corrective procedures demonstrated.

The Decibeloscope intensity indicator developed by the Syracuse University Speech Laboratory has been added to the experimental and educational equipment of Ohio State University, the University of Pittsburgh and Geneseo, New York, State Teachers College. The Rochester, New York, School for the Deaf, after two years of use of this instrument, has added a second unit to its visual aid equipment.

Michael F. Walsh, Director of Education, State of Rhode Island, reports that a committee is now at work on a complete developmental program for the improvement of the exceptional child.

The Speech and Hearing Clinic of Bradley University, under the direction of Dr. Clara K. Mawhinney, expended its staff during the summer session to include several members of

the Peoria Public Schools Speech and the Peoria, Illinois, Public Schools Speech and Hearing Department.

Mr. Tom Nelson, Supervisor of Speech Correctionists in the Peoria schools, taught courses in lip reading and in the training of the acoustically handicapped. Miss Ann Frueh supervised the Speech Improvement Clinic for Spastics. Mr. Milton Eastman was Director of Social Experiences and Clinical Supervisor at Glendale Cottage on the campus.

Two other members of the Public Schools Speech and Hearing Department, Miss Marjorie Munns and Mrs. Jean Cox Knight, were engaged in conducting a comprehensive hearing survey among the schools. Individual audiograms were taken on every child in grades two through seven, among eight of the city's public schools. This survey is approved and financed by the state special education program.

Thirty-two public school teachers of the Denver schools are expected to complete a three-year evening course in speech correction in December. Mrs. Helen Roberts Liggett, Supervisor, is coordinator of the project. The group has been receiving training on Monday evenings with Dr. Ruth Clark, Dr. Robert Harrington, and others from the staff of the School of Speech of the University of Denver. The occasion for the formation of the class was a grant by the Field Foundation. The motokinaesthetic methods of Dr. Edna Hill Young have been given a special emphasis for classroom use in this project.

The fifth anual conference of the New England Speech Association will meet at the Hotel Statler, Boston, Massachusetts, on November 26 and 27, 1948. Albert R. Thayer, vice-president of the Association (Bowdoin) is chairman of the program committee. There will be nine section meetings and a general session on all phases of speech. Dr. John V. Neale is president of the organization.

The Department of Psychology, University of Pittsburgh, has offered for the second year an interesting course entitled 'Approaches to Counseling, Guidance and Psychotherapy.' Five distinguished speakers participated during the six weeks summer session. Each speaker was on the campus for one full week and lectured for two hours each day, as well as being available for consultation. The lecturers were Dr. F. C. Thorne, Dr. Peter Napoli, Dr. Jon Eisenson, Dr. Wilbur E. Moore, and Dr. Ralph F. Berdie.

The Michigan Hearing Conservation Program of the Michigan Department of Health has just received delivery of a new mobile hearing trailer. The trailer was assembled by the Sellhorn Trailer Company of East Lansing under the direction of the Michigan Department of Health according to specifications suggested by Dr. Gordon Peterson, Dr. C. V. Hudgins and others. It consists of a sound-treated room and a control room divided by a viewing window built into a 21-foot trailer shell. The unit is equipped with a three-channel electro-acoustic amplifying system for carrying free voice, electrical transcriptions, and noise or pure-tone signals. A talk-back channel connects the testing and control rooms.

The unit will be used primarily in rural areas in connection with the hearing conservation program. It will provide suitable testing quarters as well as equipment for clinical speech reception testing. In the future it is planned to use the unit to provide services for rural children who do not live near a speech and hearing clinic in connection with the department's hearing aid project and the summer hearing aid programs at Ypsilanti and at Bay Cliff Camp in the Upper Penninsula.

The mobile unit is believed to be

the first of its kind built. Anyone wishing to have further information about the unit may write to Courtney D. Osborn, Senior Hearing Consultant, Michigan Department of Health, Lansing 4, Michigan.

The Speech and Hearing Clinic, Purdue University, conducted intensive courses in speech correction, lip reading and hearing conservation for school teachers and nurses from June 18 to July 9. For the third successive year, the Indiana Society for Crippled Children has established special scholarships for Indiana School teachers and nurses to attend these courses. This year 50 scholarships were made available by the Society. In addition to the scholarships, the Society sponsored the Children's Speech and Hearing Clinic which included 50 crippled children manifesting a wide variety of speech and hearing problems. In conjunction with the above courses, the following visiting lecturers conducted special lectures. Dr. Martin Palmer, Director, Institute of Logopedics, Wichita, Kansas; Dr. Robert West, Director, Speech Clinic, University of Wisconsin; Dr. Grant Fairbanks, Professor of Speech Science, University of Illinois; and Miss Jacqueline Keaster, Assistant Professor of Hearing, University of Iowa. Other visiting lecturers included school superintendents, doctors, professors of education and clinical psychology, the Director of Special Education in Indiana, and Miss Jayne Shover and Miss Louise Baily from the National Society for Crippled Children and Adults.

A number of new diagnostic and training instruments have been developed in the Purdue University Speech Science Laboratory during the past year. These include a new type nasalometer, an instantaneous speech timer, and a visual speech intensity demonstrator. These instruments are available for clinical as well as for research purposes.

A new program for training teachers of the handicapped has been introduced at the New Jersey State Teachers College at Newark. Dr. Darrel J. Mase is in charge of the program. Training programs are now under way for teachers of the mentally retarded, teachers for the hard of hearing and teachers of speech defectives. It is planned to open two other curricula in the next year or so, namely, the partially seeing and the orthopedically handicapped. A limited number of students in the college are allowed to elect one of these specialized areas in their junior year. Superintendents and school administrators are also sending in successful teachers to receive certification in one of these specialized areas.

The State of New Jersey has published a helpful pamphlet, *The Classroom Teacher Can Help the Handicapped Child*, which can be obtained by writing the Department of Education.

The New York Society for Speech and Voice Therapy has been holding regular monthly meetings at Hunter College. The programs have been planned for broad coverage of the field. Each session has seen a case demonstration followed by a discussion of the case, the last half of the program being devoted to a lecture by an authority in that particular area. Guests are welcome. Dr. Emil Froeschels is the president of the organization.

The Speech and Hearing Clinics at Kent State University have added Majorie Gallant (M.A., Iowa) and Rachel Dawes Davies to their staff. Mrs. Davies will be responsible for training prospective teachers of the deaf. An entire curriculum for training teachers of the deaf will be in effect at the beginning of the September quarter of 1948. Another recent addition has been a special clinic for children between the ages of eighteen months and three years who have

hearing losses. Parents of these children attend the same classes in order to receive instruction in helping the hard of hearing or deaf child. Twenty-five children had the opportunity to receive special help in speech and hearing problems during an eight-week clinic period beginning June 29th.

Under the auspices of the Army Aural Rehabilitation Center, Walter Reed General Hospital, Washington, D. C., the third in a series of meetings dealing with the general problem of impaired hearing was held on June 5, 1948. These meetings have been held so that various groups interested in the rehabilitation of persons with defective hearing can get together to discuss problems and procedures. The program was divided into two parts. The morning session was devoted to a discussion of hearing aids, audiometers, and problems in testing. The afternoon centered around rehabilitive procedures. Representatives from military, veteran, and civilian clinics reported on progress and problems.

The University of Illinois and the Illinois Association for Exceptional Children were the joint sponsors of a conference on the education of the exceptional child July 15 and 16 in Champaign. There were general and sectional meetings covering all phases of the work.

The Department of Speech, Ohio State University, had a number of visiting lecturers during the summer quarter. Among the speakers were Margaret Hall, Ph.D., Chicago: Wilbert Pronovost, Ph. D., Queens College; Adelaide McClelland, M.Ed., Director, Speech and Hearing Clinic, Bowling Green State University; Charles Van Riper, Ph.D., Western Michigan College of Education; George Herman, M.S., Wayne University; Mildred Gross, M.A., Detroit Public Schools; Claude E. Kantner, Ph.D., Ohio University; Jeanette Anderson, Ph.D., Rockford College; John Clancy, M.A., University of Michigan; Marsee Fred Evans, Ph.D., Birmingham-Southern College.

The Cooperative School for Deaf Children of Houston, Texas, is startting its second year. Last year, 23 deaf and hard of hearing children of preschool age were taught speech, speech reading, nursery school subjects, as well as learning to live and play with other children.

The school is sponsored by the Cooperative Club, a group of public-spirited Houston business men. The school has three teachers: Lauren E. Stolp, Superintendent, Mrs. Floyd Simpson and Mrs. Leo Simms. They also have the backing of an active parents group.

The Chicago Heights School System offered for the fourth summer a special program for speech and hearing problems. Individual and group instruction were given three mornings a week. Mrs. Edna Gordon was in charge and was assisted by Mrs. Marjory Kempster.

The Indiana University Medical School of Indianapolis is developing a program for speech and hearing handicapped individuals, both in-patients and out-patients. The program is being worked out jointly between the University hospital staff and the staff of the Speech and Hearing Clinic at Bloomington, which is under the Department of Speech.

The Speech and Hearing Clinic at Indiana has a new building, which it shares with the Psychological Clinic and Reading Clinic. This building was especially constructed to meet the need of all three clinics and enables them to work collectively. As soon as a new soundproof room and sound laboratory are completed, the Clinic will have ample space to take care of its many clinical programs.

An expanded program for resident

clinic work became effective during the summer of 1948 and will progress during the academic year of 1948-49. An occupational therapist, a remedial reading clinician, and three speech pathologists are devoting their full time to work with children who are enrolled in the Clinic. In addition, there are individuals who act as graduate assistants and who are hired to work with the University students, foreign students, and veterans.

The Georgia Speech Association sponsored Dr. Beatrice Jacoby and Dr. Jon Eisensen for courses on 'The Exceptional Child with Emphasis on Speech Correction' at the teacher's work shop at Emory University this past summer. They also sponsored Dr. Mary Huber for the same work at Oglethorpe University. Dr. Huber's work was supplemented by occasional lectures by Dr. Jacoby.

Whittier College has recently been accredited by the California State Department of Education to grant the Special Speech Correction Credential for public school speech correctionists.

The Purdue Speech Science Laboratory is completing the second year of a contract with the Office of Naval Research concerning investigations related to intelligibility of communication. Approximately $75,000 has been made available by the Navy Department for this research program. A number of research studies have been completed and reported, and many new research studies are in progress. Dr. M. D. Steer, Director of this program, is working in conjunction with the Navy Research Program with Dr. J. C. Kelly, Mr. T. D. Hanley, Mr. G. Draegert, Mrs. J. Harris, three electronic technicians and a statistical and stenographic staff. In conjunction with this program, four new acoustical laboratory rooms have been constructed, and considerable instrumentation is being used. Assistantships in connection with this program are available for qualified persons. It has been indicated that this research contract will be renewed by the Navy Department.

Since 1941, Purdue University has maintained a public school Traveling Hearing Test Service. This unit has administered Audiometrics to an average of 20,000 pupils per year. This service was under the supervision of Miss Bernice Fein during the 1947-48 school year.

An 110-page bound report, containing the complete proceedings of the 1947 Annual Convention of the National Society for Crippled Children and Adults held last Nov. 2-5 in Chicago, is now available at the National Society's headquarters.

The report, which carries out the convention's theme, 'The Handicapped—A Great National Resource,' includes speeches by some of the nation's leading specialists in education, rehabilitation and cerebral palsy who spoke at the four-day meeting.

Among the numerous speeches given at the convention, the report contains papers by The Most Rev. Bernard J. Sheil, Auxiliary Bishop of Chicago and Founder-Director of the Catholic Youth Organization; Lawrence J. Linck, Executive Director of the National Society; and Miss Jayne Shover, Director of the National Society's Cerebral Palsy Service.

The convention report also includes three panel discussions: 'What a National Movement for the Handicapped Can Accomplish—As We See It,' 'Needs for Rehabilitation Services,' and 'As We Look Ahead,' a symposium entitled 'Removing Road Blocks for Cleft Palate and Other Dental-Facial Handicapped,' and a demonstration clinic on Cerebral Palsy.

Copies of the 1947 Annual Convention Report can be obtained from the National Society for Crippled Chil-

dren and Adults, Inc., 11 S. LaSalle Street, Chicago 3, Illinois, at $1 each.

Almost eight per cent of all children examined in the Will County hearing project were found to have had hearing deficiencies in one or both ears, Dr. Francis L. Lederer of the University of Illinois College of Medicine announced recently.

Audiometric examinations were given to 20,644 pupils in 188 public and parochial schools in the county in a project which was conducted during the past seven months. The survey indicated that over 1,650 children had hearing deficiencies.

Fourteen hundred and seventy of the hearing deficient children were examined by Dr. Arnold A. Grossman and Dr. Richard E. Marcus at 77 different otological clinics throughout the county. Following examination by the program otologists, those requiring further care either to rehabilitate or to conserve hearing were referred for definitive treatment to the local otologists and general practitioners.

Recommendations for specific educational requirements for those found to have handicapping hearing losses will be prepared by a special subcommittee before next September. In the meantime, temporary educational arrangements have been made by the program otologists.

The program for pilot hearing conservation and rehabilitation was organized to provide also for continuous follow-up care. It offers educational and vocational guidance in future years after the initial procedures have been completed. A permanent record for each child has been established at the Will County Health Department.

The Will County hearing project is expected to serve as a model for future hearing conservation programs in other counties of the state. The work in the field was conducted by representatives of the University of Illinois College of Medicine, the Illinois Eye and Ear Infirmary, the Division of Services for Crippled Children, and the Will County Department of Health.

Cooperating groups and agencies included the Chicago Hearing Society, State Department of Public Instruction, State Department of Public Health, Illinois Teachers for the Deaf, Illinois School for the Deaf, Illinois State Normal University, Will County Superintendent of Schools, the parochial schools of Will County, the Superintendent of Joliet schools, the Will County Medical Society, and the Kiwanis Foundation for the Hard of Hearing.

Mother Hubbard's Slidefilm Cupboard, a series of eight discussional slide-films produced in color by The Jam Handy Organization, is now ready for school use. This series of films is accompanied by carefully prepared manuals with specific instructions for the teacher. The slide-films are used with a series of reading workbooks, *Mother Hubbard's Reading Shelf.* The purpose of the series is to stimulate and hold interest, to make it possible for beginning readers to understand and follow directions, to enable them to read more rapidly and more accurately than with traditional procedures, and to make the management of the group easier for the teacher. For details on these slide-films write to The Jam Handy Organization, 2821 East Grand Boulevard, Detroit 11, Michigan.

The physical condition of many millions of the world's children, as an aftermath of the world's most tragic conflict, is a problem of vital concern to professional people of the present era. Two-thirds of the 2,310,000,000 people alive in the world today are not getting enough to eat. Half of all the people alive are actually living close to the starvation line. Forty per cent of the earth's population consists of children under the age of fifteen, and forty per

cent of the people near starvation are children under fifteen. These statistics present a vivid picture of the so-called "growing generation." By means of a unified appeal to be conducted in February, 1949, the American Overseas Aid-United Nation Appeal for Children hopes to raise $60,000,000 with which to aid these children. Those who wish to make contributions prior to or during the nationwide drive may do so through their local community agencies or by sending contributions directly to AOA-UNAC national headquarters, 39 Broadway, New York 6, New York.

A panel discussion on 'Speech Pathology in Special Education and in Clinical Practice' was held by the Southern California Psychological Association at the University of California on July 9. Members of the panel included Dr. Sara M. Stinchfield-Hawk, Past President of the American Speech and Hearing Association and Director of the Speech Clinic, Claremont Graduate School; Dr. Elise Hahn, Chairman of the Committee on Speech of Elementary School Children for the Speech Association of America and Director of the Speech Clinic, University of California at Los Angeles; Dr. Lee Edward Travis, Past President of the American Speech and Hearing Association and Head of the Department of Speech, University of Southern California; and Dr. Joseph T. Johnston, Director of the Speech and Hearing Laboratories of the University of Southern California. Other members of the panel, by invitation, were Dr. Wendell Johnson (Chairman), Editor of the *Journal of Speech and Hearing Disorders*, Director of the Speech Clinic at the University of Iowa, and Visiting Professor of Psychology and Speech at the University of Southern California; Dr. Howard P. House, Associate Professor of Otorhinolaryngology; and Dr. Harold Boyd, Clinical Instructor in Otorhinolaryngology, both of the University of Southern California School of Medicine.

The Grinnell College Department of Speech, under the auspices of the Iowa Society for Crippled Children and the Disabled, held a speech improvement program for a period of six weeks (from June 8 to July 17) on the Grinnell College Campus. The program was under the direction of Velma B. Hiser, Assistant Professor of Speech.

The 42 children enrolled were housed in Main Hall, one of the college dormitories. In addition to individual and group classes in speech correction, a full program of supervised recreation was provided under the direction of Miss Dorothy Pulley, Assistant Professor of Physical Education. The program provided extensive opportunity for clinical practice for undergraduates majoring in speech correction and physical education.

In addition to the speech therapy program, a course entitled 'Speech in Education,' designed primarily to orient teachers and prospective elementary teachers in the field of speech, was taught by Mrs. Hiser.

Texas State College for Women at Denton, Texas, held a boarding Speech Therapy Clinic this summer. One dormitory was set aside for boys, another for girls. The summer was divided into two terms of five weeks each. At the end of the time, parents were asked to come for a two-day conference at which time there were lectures, discussions, and individual conferences with each parent.

This was the first time that such a clinic had been held in the Southwest. It was felt that the project was very successful, and plans have been made to repeat it each summer. Dr. Amy Allen directed the Speech Therapy Clinic. Miss Dorothy Sherman of Des Moines, Iowa, was Supervisor of Teaching. During the second term, Dr. S. Richard Silverman conducted a hearing clinic.

Personals

Dr. Howard L. Runion has resigned as Professor and Head of the Department of Speech and Director of the Speech Clinic at the University of Maine. He has accepted a position as Professor and Head of the Department of Speech at the College of the Pacific, Stockton, California. He will take up his new duties in September.

Margaret Rowe has been appointed Speech Pathologist and Supervisor of Speech Correction in the Special Education Clinics, Indiana State Teachers College, Terre Haute. Miss Rowe is the retiring president of the Indiana Speech and Hearing Association.

Clare Cooper has resigned her position as Acoustic Specialist at the Hearing and Speech Clinic, U. S. Naval Hospital, Philadelphia, to do graduate work at Northwestern University. Mary Free and John Harrison have recently joined the staff at the hospital.

Helen Fagan Bender has joined the staff of the New Jersey Chapter of the National Society for Crippled Children and Adults. She will work on the state program for cerebral palsy. Dr. Darrel J. Mase is president of the New Jersey Chapter.

Miss Thelma Sherman, who received her Master's degree in speech from the University of Denver in August, has been appointed to the position of Supervisor of Speech Correction for the Oregon State Department of Education. She will begin her duties in September.

Dr. Richard Parry, Director of the Speech Clinic at the University of Colorado, has accepted a position in the Clinic at the University of Hawaii. He will commence his duties in September.

Esther Terry Holman is now speech therapist at the Illinois Children's Hospital School in Chicago. She was formerly on the staff of the Speech Clinic at Purdue University.

Charlotte Avery, Assistant Professor of Special Education at Michigan State College, has accepted a position as Clinical Audiologist in the Audiology Clinic, University of Pittsburgh Medical School. She was demonstration teacher in the School of Speech, Northwestern University, during the past summer.

Miss Antoinette Rini and Miss Mary Yeager have been putting in full time at the University of Denver in working upon speech and hearing disorders referred to the clinics by the Veterans Administration.

Miss Jane Morrison, of the staff of the Davison School of Speech Correction, was at Pennsylvania State College for the summer. Miss Morrison assisted in the Speech Clinic and continued her graduate work. During her absence she was replaced by Mrs. Margaret Sharp of Wesleyan College.

Berniece R. Rutherford, who has been speech clinician at Dowling School, Minneapolis, for a number of years, has accepted the position of Director of the new Rehabilitation Center of St. Paul, Minn. Mrs. Rutherford has pioneered in the field of speech correction for the cerebral palsied. Besides her work at Dowling, she has lectured on and demonstrated techniques used in the correction of cerebral palsied speech disorders at the Universities of Minnesota and Washington.

Mr. James H. Platt, Director of the speech clinic of the Department of Written and Spoken English, Michigan State College, has been promoted to the rank of Assistant Professor.

Miss Francis Hebb, Speech Correction Supervisor, Montebello School District, California, was visiting instructor, teaching courses in Advanced Speech Correction and Voice and Diction at Whittier College during the past summer. Mrs. Hazel Whitsen, Public School Audiometrist for Monrovia and Arcadia School Districts was a visiting instructor teaching a course in Audiometry and Aural Rehabilitation at Whittier College during the same period. Regular members of the staff are Herold Lillywhite, Director of the Speech and Hearing Clinic, Granville Basye, Kenneth Beyer, and Mrs. Betty Moore, clinical assistants.

The Speech and Hearing Clinic of Whittier College announces the appointment of Mr. Alfred Larr of Stanford University as Assistant Professor of Speech and Director of the Speech and Hearing Clinic. His duties will begin September, 1948. Mr. Larr is a clinical member of the American Speech and Hearing Association.

Mr. J. H. Gaeth, who is completing his Ph.D. in Audiology and Speech Correction at Northwestern University in August, has been appointed to take charge of the Intermediate and Adult Clinics in speech and hearing disorders at the University of Denver. An expansion of the clinical and training programs in hearing is underway.

Miss Elizabeth Miller, Youngstown, Ohio, directed a months' summer speech and hearing center for 40 children at the Tennessee School for the Deaf during the past summer. The children came to the center from over 20 counties in the state.

For a Symposium on Special Education held in conjunction with the Governor's Conference on Special Education in Indiana, Dr. M. D. Steer, Director of the Purdue Speech and Hearing Clinic, prepared a special paper on 'Organic Disorders of Speech.' The paper is included in the published Symposium covering the conference.

Miss Frances Patton represented the Purdue Speech and Hearing Clinic at the special Hearing Conference held at Walter Reed Hospital in Washington, D. C. on June 5. Miss Patton, formerly of the Aural Rehabilitation staff at United States Naval Hospital, Philadelphia, is Supervisor of the Hearing Conservation Program at the Purdue Speech and Hearing Clinic. Mrs. Florence Heywood Willmarth was formerly of the Naval staff and is active in the same program.

Dr. Robert Harrington, formerly Director of the Intermediate and Adult Clinic at the University of Denver, has accepted a position in the University of Southern California and in a hospital in Los Angeles where he will train students in the correction of hearing and speech disorders.

Mrs. Elizabeth Koops Lang resigned her position as Instructor in Speech at Ohio University this June to join her husband in further advanced graduate study at Northwestern University where both will be working on their Ph.D. degrees. The former Miss Koops was in charge of the courses and clinical program in Audiometry and Lip Reading at Ohio University.

Professor A. C. LaFollette has returned to the University of Denver to continue his graduate study. He expects to receive his Doctor's degree in the field of speech correction at the end of the summer session. Professor LaFollette has been at Ohio State University.

Bernice M. Prensky has recently received an appointment as a Clinical Psychologist (Speech Pathologist) with the Veterans Administration. She is with the Kingsbridge Hospital in the Bronx. Miss Prensky is also the Speech Consultant to the Bronx River Child Care Center—a preschool nursery. This service is on a voluntary basis.

Dr. Ruth Beckey Irwin, State Supervisor of Speech and Hearing Therapy, Columbus, Ohio, participated in a Special Education Workshop at the University of Tennessee, Knoxville, from June 14 to July 14. Dr. Irwin had charge of speech correction and lip reading instruction and activities.

Dr. Eleanor Luse, formerly on the faculty of Wells College, is now Assistant Professor of Speech at the University of Vermont and Director of the Speech Clinic. She received her doctorate from Northwestern University in June 1948.

Mrs. Gladys Bon Davis has been appointed Assistant Professor of Hearing and Speech Therapy at Western Reserve University. Mrs. Davis comes to Cleveland from Youngstown Day School for the Deaf where, as Head Teacher, she has built a large department devoted to training very young deaf children. In past years, Mrs. Davis has taught at various residential and day schools. and has served as training teacher and principal of the Department of Speech for the Deaf at Milwaukee State Teachers College and as Supervisor of Speech at the Michigan School for the Deaf.

Mrs. Davis has been employed as a full time staff member of the Graduate School and of the Cleveland Hearing and Speech Center to train teachers of the deaf and conduct research on methods of teaching the deaf.

Mrs. Lillian Read has resigned as speech clinician in the Minneapolis Public Schools.

Margaret E. Hall (Ph.D., Iowa) has been appointed Supervisor of Speech Correction in the Chicago Public Schools. Dr. Hall was formerly Psychologist and Speech Pathologist, Bureau of Child Study, Chicago Board of Education. In her new administrative post, Dr. Hall will supervise a staff of between 50 and 60 speech teachers.

Dr. Hallowell Davis, Director of Research at Central Institute, has recently been appointed chairman of the Committee of Consultants on Audiometers and Hearing Aids of the Council of Physical Medicine of the American Medical Association. This committe passes on the acceptance of new models of hearing aids and audiometers.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 283-285

Book Reviews

Ernest H. Henrikson, Editor*

MENNINGER, KARL A. *The Human Mind.* (3rd ed.) New York: Alfred A. Knopf, 1947, Pp. 517.

In his introductory chapter, the author states: 'The following chapters of this book endeavor to present the psychiatrist's conception of the human mind, with illustrations of the material from which he has derived this conception. It is only his; it does not preclude the truth of psychologists' laboratory views or philosophers' metaphysical views.' The book gives a broad, sweeping, dynamic view of mind, personality and adjustment. As would be expected, it has an abundance of case material and illustrations freely drawn from literature, religion, and everyday life. It is exceptionally well written, as is evidenced by the popularity of the first two editions. It has the vividness, and occasional dry humor, of a well-organized classroom lecture. The psychiatric point of view which it presents is one which should be thoroughly known and understood by the speech therapist.

The book is organized into four principle sections. Chapter II, the 'synthetic section,' is entitled 'Personalities.' The author first warns that 'classifications must never be taken too seriously—they ruin much thinking—but the fear to use them has prevented much more thinking.' He then proceeds to describe seven personality types: (1) the somatic type (physical illness), (2) the hypophrenic type (feebleminded), (3) the isolation type, (4) the schizoid type, (5) the cycloid type, (6) the neurotic type, and (7) the anti-social type. This section is 'synthetic' because it deals with the total personality and the characteristic adjustment pattern of the seven types. The personality types are broad and fluid, and the total adjustment pattern is stressed.

Chapter III, the 'analytic section,' is entitled 'Symptoms.' Here disorders are treated under four main categories: perception, intellection, emotion, and volition. Since there is no category of motor activity or expression, defects of speech are given only incidental notice. However, although the speech correctionist will not find any large sections in the book addressed directly to him, he will find much that is familiar in adjustment mechanisms and much that is useful in therapy.

Chapter IV, 'Motives,' is described as the 'dynamic section.' There is a general discussion of the 'unconscious,' followed by 'a dozen different ways in which the original instinctive purpose or intention is modified or disguised.' These include the familiar mechanisms of projection, rationalization, etc. This section gives a fairly complete array of the many and devious adjustment mechanisms met with in psychiatry.

And finally Chapter V, the 'pragmatic section' deals with 'Treatments.' 'All methods of psychotherapy aim at accomplishing the overcoming of . . . resistance and the transforming of the patient's energy from harmful to useful forms.' Here all methods of treatment are included under the two main categories: suppression and expression. Under the former is included hypnosis, rest, suggestion, explanation, etc., while under the latter is included catharsis, psychoanalysis, psychiatric counsel, etc. Some of the new methods in therapy, such as shock therapies and surgical therapies, are discussed. The last chapter in the book, Chapter VI, deals with psychiatry in general and with its applications to education, industry, law, and religion.

The book is well worth reading; though it does not give simple, specific techniques for those disorders which are of most interest to the speech correctionist, it gives something more valuable: a detached point of view in understanding psychological deviations, the ways in which abnormal (?) people react to their normal (?) environment, and normal (?) people react to what they take to be their environment.

The book should prove stimulating to all speech correctionists and especially to those who are interested in a deeper understanding of the dynamic personality processes. And any clinician, I feel, who has humbly and sincerely worked with stutterers, cannot but believe that a deeper and more thorough understanding is necessary.

CURTIS E. TUTHILL
George Washington University

*Dr. Henrikson (Ph.D., Iowa) is Associate Professor of Speech and Assistant Director of the Speech Clinic at the University of Minnesota (Office of the Dean of Students).

WHITEHURST, MARY WOOD, *Train Your Hearing.* Washington, D.C.: Volta Bureau, 1947. Pp. 89.

As the title of the book implies, *Train Your Hearing* proposes to outline 'a method of self-training which, if followed, will help to re-educate one's residual hearing.' The book contains three preliminary sections devoted to general instruction. The preliminary sections give a list of items to be procured for the program of self-instruction, directions on how to use an individual hearing aid, and general advice on methods for pursuing the self-training program. The book also presents 20 lessons in auditory training. Each lesson is organized around one or more of the speech sounds. Drill materials include word lists, sentence lists, and more complicated exercises employing connected speech, as well as assignments in listening to music.

The task undertaken in *Train Your Hearing* is monumental—as must be any effort to convey in printed words the nuances of auditory experience. The inherent difficulties of the subject matter are in part responsible for the book's failure to achieve its goal adequately. As important, however, is the fact that the presentation is frequently sketchy and lacking in integration.

It seems to the reviewer inevitable that a reader unfamiliar with either auditory training or the phonetic composition of speech would find the book confusing at numerous points. For example, even though initially the reader is told that each practice session should begin with a period of listening to music, the recorded selections to be used with each lesson are listed following the speech drills. Thus the reader must in essence organize his own practice session—a procedure whose value may be expected to vary with the insight of the individual. Furthermore, the relation between recorded selections and the speech material within a single lesson is not effectively clarified. Even the speech material within a lesson sometimes fails to maintain the unity of emphasis upon the phonetic element being stressed at the moment. It is confusing to find opposites like 'glad—sad' incorporated in the lesson on 'A as in Palm and Aw as in Thaw.' One developes the impression that the lessons in *Train Your Hearing* are aggregations of materials which have proved successful with classes in auditory training but that these materials are not most effectively organized. The book would have been stronger if the varied phases of auditory training had been more explicitly described and if the reader had been given more precise statements of the tasks he must undertake.

The teacher of auditory training may expect to find some of the drills in *Train Your Hearing* useful, but she will not find sufficient materials for a complete course. For example, no formally organized drill material is given on certain phonetic entities (for example, *z, oi, au*). Again, there are no exercises contrasting plosives with one another. Moreover, where exercises in contrast of consonants are given, the selection of sounds is based more on articulatory relationship than on auditory similarity. Finally, the drill materials are sufficiently limited so that they are soon exhausted.

In summary, *Train Your Hearing* lacks the detail and preciseness of instruction required by the person who wishes to use the book as a means of self-teaching, and the book lacks the variety and wealth of drills which would make it an important source of materials for the teacher.

RAYMOND CARHART
Northwestern University

BARNES, GRACE. *General American Speech Sounds,* Boston: Heath, 1946. Pp. vi, 129.

This book aims to 'present in the simplest manner possible the forty-three sounds of General American speech and to provide drill for perfecting them.' The author presents the sounds by means of the symbols used in Webster's *Collegiate Dictionary,* plus key words. I. P. A. symbols as found in Kenyon and Knott's *Pronouncing Dictionary of American English* are included also. That the presentation is not altogether simple is probably more a fault of the system of diacritic markings than it is the author's. Her attempt to use these symbols is a well-intentioned one, since, for the present at least, the great majority of high school students use dictionaries that do not use the I.P.A. system. The reader is once again impressed, however, with the marked advantages in simplicity and efficiency which I.P.A. holds over diacritic markings.

There are three main sections of the book. The first presents a brief description of the vowel, diphthong, and consonant sounds, using the familiar vowel diagram and consonant chart. A few words are given for each sound, illustrating its use in the initial, medial, and final positions, and three sentences, 'loaded' with the sound illustrated, are provided for practice. This section is intended 'for younger students or those unfamiliar with the subject.' If this is its purpose, the advisability of the inclusion of some of the materials is questionable. For example, the whole array of diacritic symbols, including all duplicate sounds, and the naming of the marks themselves, might serve to confuse rather than enlighten. In the hands of a good teacher, however, such materials can be managed judiciously, or omitted entirely in some cases.

Part Two is made up of 'detailed description and advanced drill.' This section is unique in its photographs and drawings illustrating the position for each sound. A short description of the sound is given, a more extended list of sample words, several sentences, and a few short selections from literature provide materials for practice. A particular attempt is made to include common words often mispronounced. In several ways this would appear to be the most useful section of the book. The approach here is uncluttered with details and terminology.

Part Three is called 'Teaching-Learning Aids,' and includes notes from the author's own classroom comments, intended to be used by other instructors or by the student if he is using the book without a teacher. In the latter instance, a phonograph record is available, on which Miss Barnes herself pronounces all the sounds of American speech and demonstrates typical drill procedure.

Since the manner of producing the sounds of American English, their classification and symbolization, creates many arguments among phoneticians, it is not surprising that several questions could be asked about their presentation in this book. For example, one wonders why the dipthong [ei] is presented as [ɛɪ]; why [r] is classified as a fricative when in the 'Teaching-Learning Aids' the author mentions that 'as it is usually pronounced in General American speech it is really not a fricative consonant;' why [ɔ] is symbolized as [ɑ] throughout the text when on page 117 the author states that, '[ɑ] is respelled [ɔ] in most dictionaries.' More important questions are these: Since the author professes to write for 'those who wish to pronounce these sounds (of General American speech) correctly, but who are not concerned with the fine distinctions so dear to the hearts of speech specialists,' why are [ȧ], [a] and [ɔ] [ɒ] taught as if there are no acceptable substitutes for them? Likewise, is it advisable to teach the sounds in accented syllables only, to the exclusion, for example, of the schwa [ə], with the tendency toward pedantic pronunciation which might well result? One cannot avoid hoping that most students will omit the section of Part Three concerning the action of the diaphragm, which is said to 'flatten' when the lungs 'push down upon it,' although such errors are not common in the book.

Certainly Miss Barnes' text has value for the drill materials provided. If the capable teacher focuses attention on the parts most needed by her students, and does not emphasize those details on which the experts themselves cannot agree, *General American Speech Sounds* should be of practical use for articulation improvement.

ELAINE PAGEL PADEN
University of Illinois

GRATKE, JULIETTE M. *Help Them Help Themselves.* Dallas, Texas: Texas Society for Crippled Children, 1947. Pp. 184.

This book gives the best picture this reviewer has yet seen of cerebral palsied children and their problems. Anyone reading it—therapist, teacher, parent or other interested person—cannot help gaining a much better understanding of these children.

Numerous practical suggestions are given for feeding, dressing, sleeping and toilet habits, speech training, use of hands and arms, and locomotion. Not only is an entire chapter devoted to a discussion of emotional balance and personality adjustment; throughout the book special attention is devoted to the difficulties parents find in facing their problems and ways in which many of these difficulties may be resolved.

Mrs. Gratke strongly emphasizes the importance and value of careful planning for coordinated treatment by medical, education and therapeutic personnel trained in the field of cerebral palsy. These coordinated services are especially important in view of the multiple handicaps so frequently possessed by the cerebral palsied child—defects of vision, hearing, and speech, in addition to motor disability. She points out that while the child must be treated as a whole, it is necessary for parents to understand also the implications of each of these accompanying handicaps, and to make every effort to insure that his education and social development parallel medical care and treatment.

This little volume is especially valuable for the insight it presents from the parent's viewpoint in the treatment of the cerebral palsied child. The blend of interest of professional person and parent which has so long been needed by all persons working with cerebral palsied children, is achieved here with great success.

Mrs. Gratke has performed a most difficult task in combining technical excellence with warmth, simplicity and human understanding. This is certainly recommended reading for all who are interested in or charged with the responsibility of handling cerebral palsied children.

JAYNE SHOVER
National Society for Crippled Children and Adults, Inc.

JOURNAL OF SPEECH AND HEARING DISORDERS, 1948, **13**, 285-288

Abstracts of Current Articles

Mary Huber*

AMOS, M. Speech rehabilitation for veterans. *Quart. J. Speech*, 1948, **34**, 73-87.

The real magnitude of the speech correction problem among veterans cannot be accurately estimated. A relatively high percentage of cases of veterans with maxillofacial disabilities, with disorders of the larynx or organic aphonia, and with hearing conditions which may affect speech, cases of traumatic encephalopathy and cerebral arteriosclerosis have developed speech disorders, but no definite figures are obtainable.

The author deals mainly with the two speech rehabilitation programs set up by the Veterans Administration in helping to solve speech correction problems incurred by men during the war. Services are offered under the Department of Medicine and Surgery, and the Office of Vocational Rehabilitation and Education, thus providing both medical and vocational treatment for the patient. The Department of Medicine and Surgery offers medical and surgical care, corrective therapy, physiotherapy, and occupational therapy. The purpose of vocational rehabilitation, as stated in the law authorizing the program, 'is to restore employability lost by virtue of a service-incurred disability.'

The work of the two departments (the Vocational Rehabilitation and Education, and the Department of Medicine and Surgery) is helping those veterans with speech disorders to readjust themselves in a linguistic society. *(Phyllis E. Paull, Brooklyn College.)*

EGAN, J. P. Effect of noise in one ear upon the loudness of speech in the other ear. *J. acoust. soc. Amer.*, 1948, **20**, 58-62.

By way of tests, it was found that, as the intensity of noise is turned up in the left ear, the loudness of speech heard in the right ear increases. The amount of this increase depends upon the physical intensity of received speech. As the noise is further increased to a high level, the speech decreases in loudness. This decrease represents the phenomenon of binaural or 'cross' masking.

The order of presentation of the stimuli and their duration are important parameters. It was soon discovered that, although the loudness of speech quickly jumped to its maximum value when the noise was suddenly turned on, it declined back to its 'normal' value at a much slower rate when the noise was turned off.

The measured change in loudness depends upon the order of presentation of the stimuli. If 'speech alone' is followed by 'speech with noise,' the measured change in loudness is maximal. However, if 'speech with noise' is followed by 'speech alone,' the extent of the measured change in loudness depends upon how long the listener waits before assessing the loudness of the speech. The increase in the loudness of speech does not disappear after repeated exposure to noise.

Some casual observations were made with stimuli other than speech and white noise. The loudness of an interruption of chopped white noise is increased when a steady noise is presented to the opposite ear. This change in loudness is of the same order magnitude as that experienced when speech is used. On the other hand, a pure tone heard in one ear does not seem to increase in loudness where noise is presented to the opposite ear. Low frequency pure tones slightly increase the loudness of speech, but high frequency tones produce noticeable effect.

The author gives two possible explanations of the increase in loudness of speech when noise appears in the opposite ear. One, is that the noise has an effect upon the muscles of the contralateral middle ear. Thus the action of the middle ear would be such as to increase the physical intensity of the speech received at the inner ear. The other is that when identical stimuli fall on the two ears the total impression of loudness is greater than that aroused by either ear alone. *(Melvin Hyman, Brooklyn College.)*

HARKINS, C. S. Cleft palate rehabilitation by prosthesis. *J. Rehabilitation*, 1947, **13**, 23-26.

The various limitations caused by cleft palate can be greatly decreased or eliminated through judicious restorative measures. The first essential in the treatment is the closure of those parts involved by surgery or prosthesis. The possibilities of surgery as a method of treatment appears to be more generally known and therefore more widely accepted as the only means of

*Mary Huber (Ph.D., Wisconsin) is Assistant Professor of Speech, Brooklyn College, Brooklyn, New York.

aiding the cleft palate person. Surgery on the lip and gum is necessary, but on the palate of certain types of cleft it has been more devastating than corrective. Oral prosthesis, the artificial replacement of missing parts within the mouth, is the preferred method and frequently the only method for some palatal clefts. Prosthesis is designed to provide a division between the nose and mouth, dental occlusion and cosmetic restoration. Cosmetic restoration is achieved by the replacement of missing teeth or a complete set of teeth and plumping of the gum ridge. This establishes the normal relationship of the upper jaw to the lower jaw thereby bringing the upper lip in line with the lower.

Through the use of prosthesis the person is able to eat, drink and swallow comfortably. It is a direct aid to speech improvement by restricting the air used for speech in the mouth and providing the utilization of the oral cavity as a chief resonator of the voice. The most important function of a prosthesis is its use in the acquisition of better speech.

After the acquisition of a speech aid it is essential that the person be taught by a speech correctionist how to use it in talking. For many cleft palate individuals it will also be necessary to make provisions for obtaining a hearing aid, auricular training, lip reading instruction and plastic surgery. *(Melvin Hyman, Brooklyn College.)*

LINCK, L. J. A national program for the cerebral palsied. *Amer. J. ment. defic.* 1947, **52**, 172-177.

The aim of this program is to assure *all* cerebral palsy victims of services in health, education, employment, welfare, and recreation, so that they may take their rightful places in society, as far as possible.

The work of Dr. W. M. Phelps proves the effectiveness of physical, occupational and speech therapy upon the cerebral palsied, when the physician, surgeon, therapist and psychologist cooperate as a team.

Of every 100,000 births there are 7 cases of cerberal palsy, in both urban and rural areas. One of these dies before reaching the age of 6. There are approximately 400,000 cerebral palsy victims in the U. S. today, up to the age of 40, 300,000 of whom are educable.

Need of the plan for the individual depends upon where he lives and what vocational orientation and intelligence capacity he has. Diagnostic procedure is necessary to determine which services are necessary for the individual case.

The program would proceed as follows: case-finding programs would find *all* handicapped children and would operate via schools and doctors. The cerebral palsied would be screened out and educable cases determined. This program provides for the proper treatment of other types of handicaps, also.

Data collected from all departments of the clinic would indicate the plan of treatment to be followed. Applications of specialized treatment will effect the maximum rehabilitation possible.

Education of the cerebral palsied should begin earlier than that of other children, because of the long periods of medical treatment necessary. For cases too severe for public education, home and hospital schools will be put in operation.

Cooperation and understanding of the parents is of utmost importance; they must be eduacted in every aspect of the condition of the patient.

The National Society for Cripplied Children and Adults has begun to mobilize a national program for cerebral palsy cases with the guidance of the Medical Advisory Council. *(Ruth Ginsberg, Brooklyn College.)*

MARTIN, DANIEL W. Magnetic throat microphones of high sensitivity. *J. acoust. Soc. Amer.*, 1947, **19**, 43-50.

'The intelligible part of throat vibration is caused by the actuation of the throat walls by speech sound pressure in the pharynx. . . The optimum position for a contact microphone is on the throat, above and beside the larynx, but not upon it. . . The field response of a throat microphone may vary as much as 15 db among different subjects. This variation is not entirely a function of the throat wall construction.'

The author suggests that the variation may be due to differences in 'oral efficiency,' which he defines as 'the ratio of acoustical power generated in the pharynx and that radiated into the external sound field.' In the experiments described, 'the subject on whom the field response of the [throat] microphone was highest has a voice which sounds restrained, and his maximum acoustical output is somewhat below that of other subjects.'

An inertia-operated throat microphone is described which is said to be sufficiently efficient to be used in sound-powered telephone systems. *(William J. Temple, Brooklyn College.)*

MARTIN, DANIEL W. and ANDERSON, LESLIE J. Headphone measurements and their interpretation. *J. acoust. Soc. Amer.*, 1947, **19**, 63-70.

The purposes of this article are 'to illustrate and emphasize the need for closer correlation between the acoustical measurement data provided for the headphone user and the acoustical performance which he will obtain.'

The authors discuss headphone response-frequency characteristics, sensitivity, electrical impedance-frequency characteristics, non-linear distortion, and reduction of external noise. Each of these performance factors is related to its measurement, its variability in actual wearing on the users' ears, and its relative importance in application.

They also discuss the limitations of the couplers which have been used for making measurements of headphones on 'artificial ears' and describe the requirements for an improved artificial ear based in part on their experiments. (*William J. Temple, Brooklyn College.*)

NATHANSON, YALE S. and NATHANSON, JULIET E. *Manual of corrective speech exercises.* (Distr. by Jo Nathanson, 2048 Pine Street, Philadelphia, Pennsylvania.)

This manual is a condensation of 'An analysis of sounds and frequency of words basic to a new method of corrective speech' by Yale S. Nathanson, 1930, and 'Correction of Defective Speech' by Edwin B. Twitmyer and Yale S. Nathanson, 1932.

For those not familiar with the studies mentioned above, it may be worthwhile to become acquainted with the authors' 'progressive allocation' of sounds which they feel is a most important factor in speech correction.

This should prove to be a useful, though inexpensive, drill manual in speech clinics where adult articulation and foreign accent problems are handled in groups. (*M. H.*)

OWEN, T. V. and STEMMERMANN, M. G. Electric convulsive therapy in stammering. *Amer. J. Psychiatry,* 1947, **104,** 410-413.

The authors illustrate the value of the pluralistic approach to the problem of stammering. A case is reported in detail in which psychotherapy, speech training, and electric convulsive therapy were utilized.

Physicians and psychologists who treat stammering note that psychogenic factors in the disorder are outstanding. The three factors frequently used as psychotherapeutic guide posts are:

1. Stammerers are controlled by domineering mothers.
2. Stammerers are more repressed than are most psychoneurotics.
3. Stammerers seem to have made a satisfactory social adjustment. This last factor is particularly disadvantageous to the patient in that this adjustment camouflages his deep seated anxieties preventing perception of the basic difficulty.

Electrical convulsive therapy is used in the treatment of severe stammering to shorten the period of treatment and to induce a more suitable atmosphere for both psychotherapy and speech reeducation. The dominant psychoneurotic traits become amenable to psychotherapy after the convulsive treatment releases the patient's inner tension. The effects following petit mal were appreciably better as compared with grand mal. Here again, the difference is emphasized between the psychoneurotic and the psychotic, in the latter the reverse being true.

Improvement in speech after convulsive therapy was remarkable, followed by relapse when situational difficulties became qualitatively and quantitatively greater than the insight of the patient. (*Leona M. Segal, Brooklyn College.*)

POHLMAN, M. E. The artificial middle ear. *Ann. Otol., Rhinol. & Laryngol.,* 1947, **56,** 647.

An acoustic probe was made, fashioned after the columella, a single sticklike structure similar to the ossicular chain in the middle ear of the bird.

The artificial middle ear is made with a small, invisible, plastic insert that can be fitted accurately to the external meatus. When the prosthesis has been properly fitted, the patient can be taught to introduce, remove and repair the insert.

The probe enters the ear canal through a speculum and the exposed medial tympanic wall is touched lightly. When the probe touches a yielding portion of the vestibular wall, the hearing of the patient should improve, if he can be helped by the prosthesis.

There are, generally, two contact areas that produce positive reactions—one being the fenestra rotunda, the other being the fenestra ovalis. (Some patients, however, may respond to only one of these contact areas.) The oval window niche enhances the higher frequencies, particularly 1024 and 2048; the round window contact area improves the audibility of the lower frequencies, especially 256 and 512.

This artificial middle ear can be used in the treatment of patients with conduction deafness due to chronic otitis media and patients whose drum membranes and ossicles are absent. An ossiculectomy may be performed for patients with discharging ear and perforated tympanic membranes which do not respond to treatment, as well as those patients who have undergone unsuccessful Lempert fenestration operations. The above named conditions may be aided by the artificial middle ear, provided that a proper contact area for the prosthesis is established.

Eleven illustrative cases are cited. (*Leona M. Segal, Brooklyn College.*)